Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

13-AMRP-0148

APR 04 2013

Mr. D. A. Faulk, Program Manager
Office of Environmental Cleanup
Hanford Project Office
U.S. Environmental Protection Agency
309 Bradley Boulevard, Suite 115
Richland, Washington 99352

Dear Mr. Faulk:

TRANSMITTAL OF APPROVED WASTE SITE RECLASSIFICATION FORM NO. 2013-006 AND SUPPORTING DOCUMENTATION FOR THE 300-32 WASTE SITE, REVISION 0

Attached for your use is the approved Waste Site Reclassification Form No. 2013-006 and supporting, "Remaining Sites Verification Package for the 300-32 Waste Site," Rev. 0. If you have questions, please contact me or your staff may contact Rudy Guercia, of my staff, at (509) 376-5494.

Sincerely,

Mark S. French, Federal Project Director
for the River Corridor Closure Project

AMRC:RFG

Attachment

cc w/attach:
L. E. Gadbois, EPA
Administrative Record, H6-08 (300-FF-2 OU)

cc w/o attach:
S. L. Feaster, WCH
T. Q. Howell, WCH
D. L. Plung, WCH
J. P. Shearer, CHPRC
G. B. Snow, WCH
C. P. Strand, WCH

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 300-FF-2 **Control No.:** 2013-006

Waste Site Code(s)/Subsite Code(s): 300-32

Reclassification Category: Interim ☒ Final ☐

Reclassification Status: Closed Out ☒ No Action ☐ Rejected ☐

RCRA Postclosure ☐ Consolidated ☐ None ☐

Approvals Needed: DOE ☒ Ecology ☐ EPA ☒

Description of current waste site condition:

The 300-32, 333 Building; 333 N Fuels Manufacturing Building; New Fuel Cladding Facility; 333 Building Remaining Soils waste site is the footprint of the former 333 Building located in the 300-FF-2 Operable Unit in the 300 Area of the Hanford Site. The 300-32 waste site was included as a candidate site in the *Explanation of Significant Differences for the 300-FF-2 Operable Unit Interim Remedial Action Record of Decision*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 2009). Demolition of the 333 Building above-grade structure was completed in September 2006. The 333 Building slab with press pit was removed to 1 m (3.3 ft) below ground surface, in July 2010. Confirmatory sampling at the 300-32 waste site was performed on January 9 and 10, 2012. Confirmatory sampling results indicated that additional remediation was required at sample location 15, due to total petroleum hydrocarbons (TPH) analyses exceeding the direct exposure clean up level. On January 2, 2013, remediation was performed at confirmatory focused sample location 15, with additional remediation surrounding the perimeter of the press pit concrete foundation. Verification sampling of the re-excavated area was performed on January 3, 2013. The selected remedy involved (1) excavating the site to the extent required to meet specified soil cleanup levels, (2) disposing of contaminated excavation materials at the Environmental Restoration Disposal Facility, (3) demonstrating through confirmatory and verification sampling that cleanup goals have been achieved, and (4) proposing the site for reclassification as Interim Closed Out.

Basis for reclassification:

The confirmatory and verification sample results were evaluated in comparison to the remedial action goals (RAGs), remedial action objectives (RAOs), and cleanup levels from the *Interim Action Record of Decision for the 300-FF-2 Operable Unit, Hanford Site, Benton County, Washington* (300-FF-2 ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 2001) and the *Remedial Design Report/Remedial Action Work Plan for the 300 Area*, (300 Area RDR/RAWP) DOE/RL-2001-47, Rev. 3, U.S. Department of Energy, Richland Operations Office, Richland, Washington (DOE-RL 2009). In accordance with this evaluation, the confirmatory and verification sampling results support a reclassification of the 300-32 waste site to Interim Closed Out. The current site conditions achieve the RAGs, RAOs and cleanup levels established by the 300-FF-2 ROD (EPA 2001) and the 300 Area RDR/RAWP (DOE-RL 2009). The results of confirmatory and verification sampling do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 m [15 ft] deep). The analytical results and rationale presented in the attached remaining sites verification package also demonstrate that the 300-32 waste site is protective of groundwater and the Columbia River. Institutional controls to prevent uncontrolled drilling or excavation into the deep-zone soil are not required. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 300-32 waste site* (attached).

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 300-FF-2 **Control No.:** 2013-006

Waste Site Code(s)/Subsite Code(s): 300-32

Regulator comments:

Waste Site Controls:

Engineered Controls: ☐ Yes ☒ No Institutional Controls: ☐ Yes ☒ No O&M Requirements: ☐ Yes ☒ No

If any of the Waste Site Controls are checked Yes, specify control requirements including reference to the Record of Decision, TSD Closure Letter, or other relevant documents:

M. S. French DOE Federal Project Director (printed)	M S French Signature	3/21/13 Date
N/A Ecology Project Manager (printed)	 Signature	 Date
L. E. Gadbois EPA Project Manager (printed)	Larry Gadbois Signature	3-21-13 Date

REMAINING SITES VERIFICATION PACKAGE FOR THE 300-32 WASTE SITE

Attachment to Waste Site Reclassification Form 2013-006

March 2013

REMAINING SITES VERIFICATION PACKAGE FOR THE 300-32 WASTE SITE

EXECUTIVE SUMMARY

The 300-32, 333 Building; 333 N Fuels Manufacturing Building; New Fuel Cladding Facility; 333 Building Remaining Soils waste site is located in the 300-FF-2 Operable Unit in the 300 Area of the Hanford Site. The 333 Building was north of Ginko Street, east of the 3720 Building, and west of the 303M, 334-A Building and 334 Tank Farm. The waste site consisted of the remaining contaminated components of the former 333 Building, including the concrete pad, subgrade soil, and piping. This waste site is not associated with 618-1, located to the east of the 300-32.

Demolition of the 333 Building above-grade structure was completed in September 2006. The 333 Building slab was removed to 1 m (3.3 ft) below ground surface (bgs), with the exception of the Loewy Press Pit. The Loewy Press was removed in February 2008 (WCH 2011). The Press Pit was demolished to 1 m (3.3 ft) bgs in July 2010 and disposed of at the Environmental Restoration Disposal Facility (ERDF). The remaining below grade structure of the Loewy press pit was left in place.

Confirmatory sampling at the 300-32 waste site was conducted January 9 and 10, 2012, per the approved *Confirmatory Work Instruction of 300-32, 333 Building Remaining Soils* (WCH 2008). Confirmatory sample results indicated that the focused sample collected at location 15 exceeded the direct exposure cleanup level for total petroleum hydrocarbons (TPH). Remediation was performed in January 2013, to remediate the area at sample location 15 and to remove additional soil surrounding the perimeter of the Loewy Press Pit. The additional removal extended 1 m (3.3 ft) beyond the perimeter of the press pit concrete foundation. The final depth of the 300-32 waste site excavation at the press pit location was 2 m (6.6 ft).

The excavation of the press pit area of the 300-32 waste site resulted in a total of approximately 398 bank cubic meters (521 bank cubic yards) of contaminated soil and debris being removed. All material was direct loaded for disposal at ERDF. The selected remedy involved (1) excavating the site to the extent required to meet specified soil cleanup levels, (2) disposing of contaminated excavation materials at the ERDF, (3) demonstrating through confirmatory and verification sampling that cleanup goals have been achieved, and (4) proposing the site for reclassification as Interim Closed Out.

Following additional remediation, verification sampling was conducted on January 3, 2013, per the approved *Work Instruction for 300-32 Waste Site Additional Remediation and Verification Sampling* (WCH 2013a). The results indicated that the waste removal action achieved compliance with the remedial action objectives (RAOs) and remedial action goals (RAGs) for the 300-32 waste site. The site was backfilled in January 2013, after final verification data evaluation and regulatory approval (EPA 2013). A summary of the cleanup evaluation for the soil results against the applicable criteria is presented in Table ES-1.

Table ES-1. Summary of Remedial Action Goals for the 300-32 Waste Site.

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Direct Exposure – Radionuclides	Attain a dose rate of less than 15-mrem/yr above background over 1,000 years.	Maximum dose rate for the 300-32 waste site calculated using sum-of-fractions evaluations is 7.87 mrem/yr above background for focused samples.	Yes
Direct Exposure – Nonradionuclides	Attain individual COPC RAGs.	All individual COC and COPC concentrations are below the direct exposure criteria.	Yes
Risk Requirements – Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	The hazard quotients for individual nonradionuclide COCs/COPCs are <1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The cumulative hazard quotient for all sampling areas (3.8×10^{-1}) is <1.	
	Attain an excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	Excess cancer risk values for individual nonradionuclide COCs/COPCs are $<1 \times 10^{-6}$.	
	Attain a cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	The total excess carcinogenic risk for all sampling areas (7.9×10^{-7}) is $<1 \times 10^{-5}$.	
Groundwater/River Protection – Radionuclides	Attain single COC groundwater and river RAGs.	No radionuclide COPCs were quantified above groundwater/river protection lookup values.	Yes
	Attain National Primary Drinking Water Regulations: 4 mrem/yr (beta/gamma) dose standard to target receptor/organ [a].	No radionuclide COPCs were quantified above groundwater/river protection lookup values.	
	Meet drinking water standards for alpha emitters: the more stringent of 15 pCi/L MCL or 1/25th of the derived concentration guide for DOE Order 5400.5 [b].	No alpha-emitting radionuclide COPCs were quantified above groundwater/river protection lookup values.	
	Meet total uranium standard of 21.2 pCi/L [c].	Uranium was quantified below levels that are protective of 300 Area groundwater.	
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and Columbia River cleanup requirements.	Residual concentrations of aroclor-1248, aroclor-1254, aroclor-1260, total PCBs, benzo(a)anthracene, benzo(a)pyrene, and benzo(k)fluoranthene exceeded soil RAGs for the protection of groundwater and/or the Columbia River. However, RESRAD modeling predicts that these constituents will not migrate to groundwater (and thus the Columbia River) at concentrations exceeding groundwater or river protection criteria within 1,000 years. Therefore, residual contaminant concentrations achieve the remedial action objectives for groundwater and river protection [d].	Yes

[a] "National Primary Drinking Water Regulations" (40 *Code of Federal Regulations* 141).

[b] *Radiation Protection of the Public and Environment* (DOE Order 5400.5).

[c] Based on the isotopic distribution of uranium in the Hanford Site Background, the 30 µg/L MCL (40 *Code of Federal Regulations* 141.66) corresponds to 21.2 pCi/L. Concentration-to-activity calculations are documented in *Calculation of Total Uranium Activity Corresponding to a Maximum Contaminant Level for Total Uranium of 30 Micrograms per Liter in Groundwater* (BHI 2001).

[d] Based on RESRAD modeling using input parameters and soil-partitioning coefficients from the *Remedial Design Report/Remedial Action Work Plan for the 300 Area* (DOE-RL 2009) for an unrestricted land use scenario, residual concentrations of aroclor-1248, aroclor-1254, aroclor-1260, benzo(a)anthracene, and benzo(k)fluoranthene are not expected to migrate more than 1 m (3.3 ft) vertically in 1,000 years (based on the contaminant with the lowest distribution coefficient [aroclor-1248] of 43.9 mL/g). The vadose zone underlying the soil below the site is approximately 14 m (46 ft) thick based on an elevation at the 300-32 waste site of 119 m (391 ft) and a groundwater elevation of approximately 105 m (344 ft). Therefore, residual concentrations of aroclor-1248, aroclor-1254, aroclor-1260, benzo(a)anthracene, and benzo(k)fluoranthene are predicted to be protective of groundwater and the Columbia River.

COC = contaminant of concern
COPC= contaminant of potential concern
DOE = U.S. Department of Energy
MCL = maximum contaminant level
RAG = remedial action goal
RDR/RAWP = *Remedial Design Report/ Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose assessment model)

The results of the confirmatory and verification sampling are used to make reclassification decisions for the 300-32 waste site in accordance with the TPA-MP-14 procedure in the *Tri-Party Agreement Handbook Management Procedures* (DOE-RL 2011a).

In accordance with this evaluation, the confirmatory and verification sampling results support a reclassification of this site to Interim Closed Out. The current site conditions achieve the RAOs and the corresponding RAGs established in the *Remedial Design Report/Remedial Action Work Plan for the 300 Area* (DOE-RL 2009) and the *Interim Action Record of Decision for the 300-FF-2 Operable Unit, Hanford Site, Benton County, Washington* (300-FF-2 ROD) (EPA 2001). These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow-zone soil (i.e., surface to 4.6 m [15 ft]), and contaminant levels remaining in the soil are protective of groundwater and the Columbia River. Contamination at the 300-32 waste site did not extend into the deep zone (below 4.6 m [15 ft]); therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone of the site are not required.

Soil cleanup levels were established in the 300-FF-2 ROD (EPA 2001) based in part on a limited ecological risk assessment. Although not required by the 300-FF-2 ROD, a comparison against ecological risk screening levels has been made for the site contaminants of concern, contaminants of potential concern, and other constituents. Those constituents exceeding the ecological screening levels in the *Washington Administrative Code* Chapter 173-340, Table 749-3, were boron, uranium and vanadium. U.S. Environmental Protection Agency ecological soil screening levels were exceeded for lead, manganese, and vanadium. Exceedance of screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because the maximum focused sample levels of manganese and vanadium are below Hanford Site background levels, it is believed that the presence of these constituents do not pose a risk to ecological receptors. All exceedances will be evaluated in the context of additional lines of evidence for ecological effects as a part of the final closeout decision for the Columbia River Corridor portion of the Hanford Site.

REMAINING SITES VERIFICATION PACKAGE FOR THE 300-32 WASTE SITE

STATEMENT OF PROTECTIVENESS

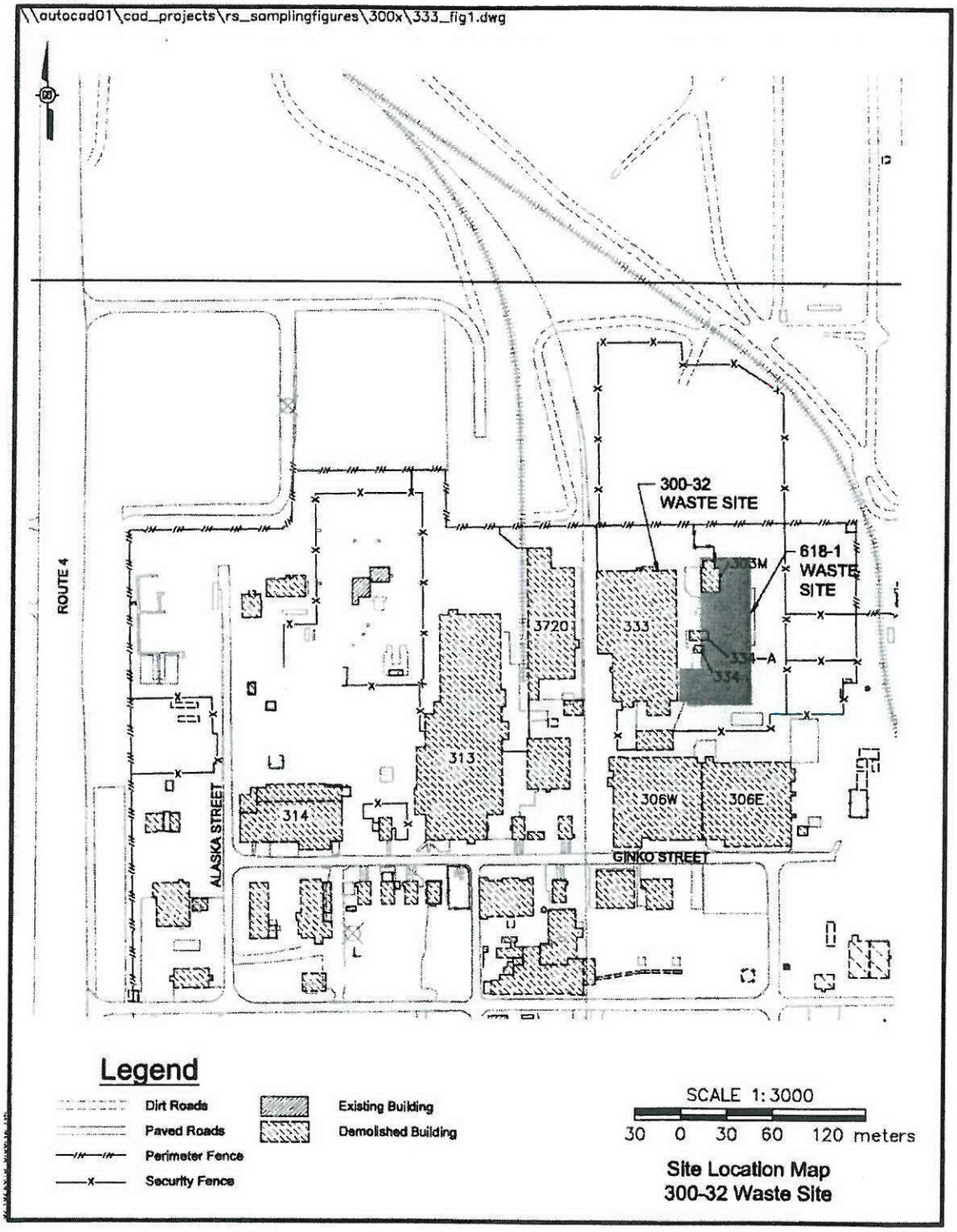
The 300-32, 333 Building; 333 N Fuels Manufacturing Building; New Fuel Cladding Facility, 333 Building Remaining Soils waste site confirmatory and verification sampling data, site evaluations, and supporting documentation demonstrate that this site meets the objectives established in the *Remedial Design Report/Remedial Action Work Plan for the 300 Area* (RDR/RAWP) (DOE-RL 2009) and the *Interim Action Record of Decision for the 300-FF-2 Operable Unit, Hanford Site, Benton County, Washington* (300-FF-2 ROD) (EPA 2001). These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a residential land-use scenario and are protective of groundwater and the Columbia River. Contamination at the 300-32 waste site did not extend into the deep zone. The waste site meets the remedial action goals (RAGs) and remedial action objectives (RAOs) for unrestricted land use; therefore, an institutional control to maintain industrial land use at the former waste site is not required.

Soil cleanup levels were established in the 300-FF-2 ROD (EPA 2001) based in part on a limited ecological risk assessment. Although not required by the 300-FF-2 ROD, a comparison against ecological risk screening levels has been made for the site contaminants of concern, contaminants of potential concern, and other constituents. Those constituents exceeding the ecological screening levels in the *Washington Administrative Code* Chapter 173-340, Table 749-3, were boron, uranium and vanadium. U.S. Environmental Protection Agency (EPA) ecological soil screening levels were exceeded for lead, manganese, and vanadium. Exceedance of screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because the maximum focused sample levels of manganese and vanadium are below Hanford Site background levels, it is believed that the presence of these constituents do not pose a risk to ecological receptors. All exceedances will be evaluated in the context of additional lines of evidence for ecological effects as a part of the final closeout decision for the Columbia River Corridor portion of the Hanford Site.

GENERAL SITE INFORMATION AND BACKGROUND

The 300-32 waste site is the footprint of the former 333 Building located in the 300-FF-2 Operable Unit in the 300 Area of the Hanford Site (Figure 1). The waste site consisted of the remaining contaminated components of the former 333 Building, including the concrete pad, subgrade soil, and piping. The 333 Building was north of Ginko Street, east of the 3720 Building, and west of the 303M, 334-A Building, 334 Tank Farm and 618-1 Burial Ground. The 300-32 waste site is not associated with the 618-1 waste site. The 333 Building footprint is approximately a rectangle, 91.44 by 42.67 m (300 by 140 ft), enclosing an area of about 4,535 m^2 (48,817 ft^2).

Figure 1. The 300-32 Waste Site Location Map.



The 333 Building was completed during 1961 to manufacture fuel elements for the new production reactor (N Reactor) using the co-extrusion process. Components were inspected and cleaned with nitric, nitric-hydrofluoric, and chromic-nitric-sulfuric acid (combined in a commercial product called Zinctone). The components were extruded in an extrusion press and machined to create fuel sections. Nitric acid was used to remove copper-silicon residues. Nitric-sulfuric acid was used to chemically mill excess uranium on fuel element ends. The fuel element was etched with nitric-hydrofluoric acids and brazed with a specific beryllium-Zircaloy-2 alloy. Fuel element supports or projections were welded on and the element underwent audioradiography. The fuel element received a final etch with nitric-hydrofluoric acid. The fuel element then underwent autoclave testing and inspection and was stored as a finished fuel element.

During the 1960s, the facility was used for testing and inspection of special lithium aluminate fuel targets used in the production of tritium. During the late 1980s, the 333 Building received modifications to prepare for the fabrication of tritium driver fuel elements for N Reactor, but the shutdown of the reactor ended this program.

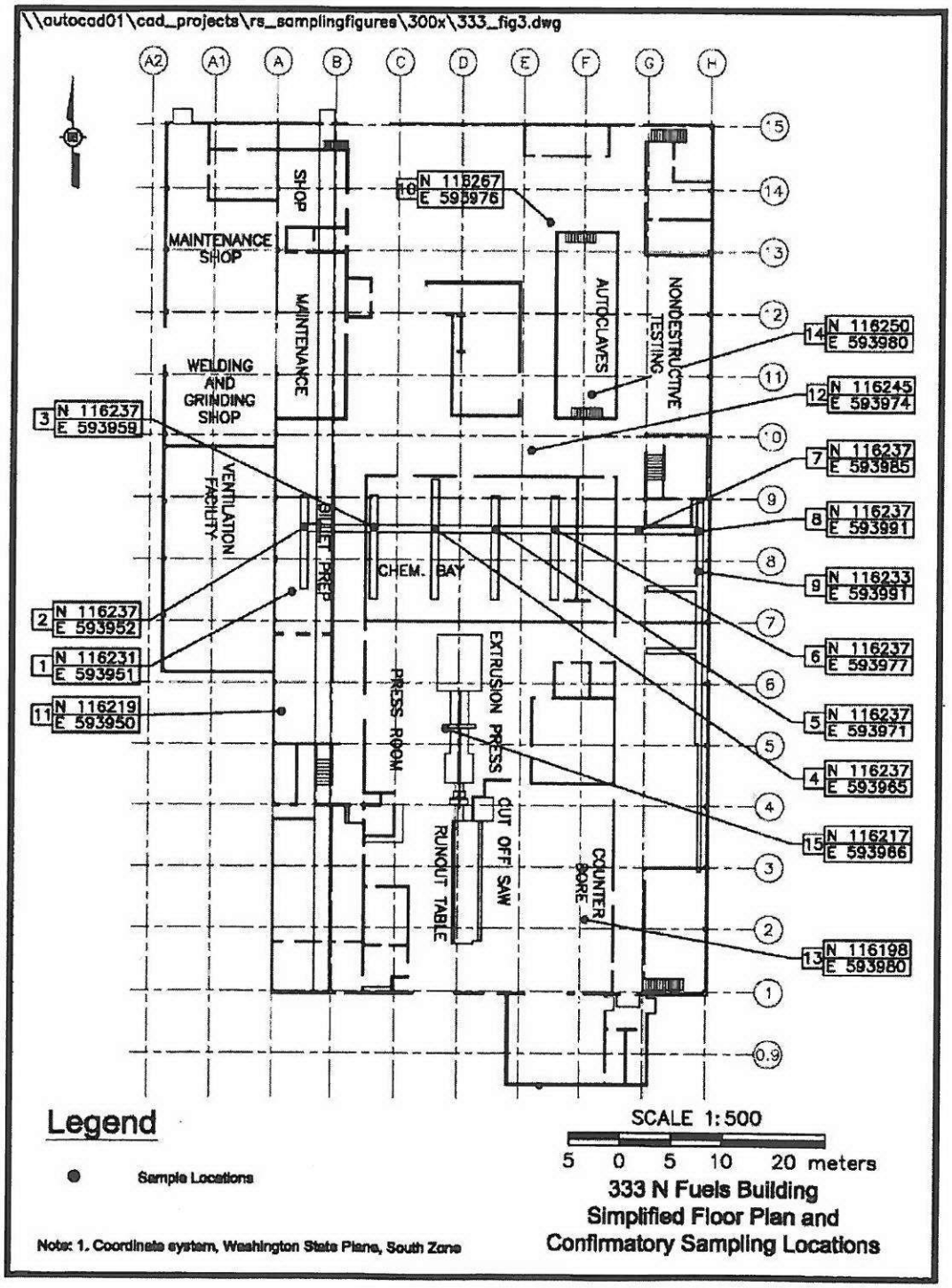
Until April 1973, waste acid from fuels fabrication in the 333 Building was neutralized in a 14,385-L (3,800-gal) underground tank that contained limestone and was located on the east side of the 333 Building. In 1973, the Waste Acid Treatment System (WATS) began operating to treat both mixed and dangerous waste from the 333 Building and from nonroutine waste additions. The 333 Building portion of the 300 Area WATS was clean closed in 1999.

Demolition of the 333 Building above-grade structure was completed in September 2006 (WCH 2011). The 333 Building slab was removed to 1 m (3.3 ft) below ground surface (bgs), with the exception of the Loewy Press Pit. The Loewy Press was removed in February 2008 (WCH 2011). The Press Pit was demolished to 1 m (3.3 ft) bgs in July 2010 and disposed of at the Environmental Restoration Disposal Facility (ERDF). The Loewy press pit foundation with the sump was left in place. The reinforced concrete foundation with the intact sump is located in the middle of the 333 Building concrete slab (EPA 2012). The 300 Area, 333 Building Facility Status Change Form deferred the removal of 333 Building foundation to the 618-1 remedial action (WCH 2008a). After completion of remediation in January 2013, the 300-32 waste site excavation was backfilled on January 18, 2013, per the e-mail concurrence, "EPA Concurrence to Backfill 300-32" (EPA 2013). Photographs of 300-32 waste site remediation are presented in Appendix A, in chronological order.

Confirmatory Sampling Summary

Confirmatory sampling at the 300-32 waste site was conducted January 9 and 10, 2012 (WCH 2012). Fifteen focused soil samples, plus quality control samples, were collected as described in the *Confirmatory Work Instruction of 300-32, 333 Building Remaining Soils* (WCH 2008b). Samples were collected at the locations shown in Figure 2, with the exception of sample location 15, which was moved approximately 1 m (3 ft) to the west due to the presence of the concrete slab at the specified sampling location (WCH 2012). Field quality control samples consisted of one equipment blank sample, one field duplicate sample, and two trip blanks. All samples were submitted for full protocol laboratory analysis.

Figure 2. The 300-32 Waste Site Confirmatory Sampling Locations.



Contaminants of Potential Concern

The contaminants of potential concern (COPCs) for the 300-32 waste site were identified based on the history of the 333 Building fuel fabrication operations and associated waste sites. The Facility Status Change Form documenting the site's demolition status identified contaminants of concern during demolition as radionuclides, metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), asbestos (Class II nonfriable), beryllium, and cadmium (WCH 2011). Contaminants of potential concern listed by the confirmatory work instruction (WCH 2008b) were arsenic, barium, cadmium, chromium, lead, lithium, hexavalent chromium, mercury, uranium-233/234, uranium-235, total uranium, chloride, nitrate, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), VOCs, and SVOCs. The expanded list of inductively coupled plasma (ICP) metals included antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lithium, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc in the analytical results package. Gross alpha and gross beta analysis were added for data evaluation purposes.

The laboratory analytical methods for the COPCs as specified in the confirmatory sampling work instruction (WCH 2008b) are listed in Table 1.

Table 1. Laboratory Analytical Methods.

Analytical Method	Contaminants of Potential Concern
ICP metals – EPA Method 6010	Arsenic, beryllium, cadmium, chromium, lead, lithium [a]
Hexavalent chromium – EPA Method 7196	Hexavalent chromium
Mercury – EPA Method 7471	Mercury
Isotopic uranium	Uranium-233/234, uranium-235, total uranium
GEA – Gamma spectroscopy	Gamma-emitting radionuclides
Gross alpha – proportional counting	Alpha-emitting radionuclides
Gross beta – proportional counting	Beta-emitting radionuclides
IC Anions – EPA Method 300.0	Chloride, nitrate
PCB – EPA Method 8082	Polychlorinated biphenyls
SVOA – EPA Method 8270	Semivolatile organic compounds
VOA – EPA Method 8260	Volatile organic compounds
TPH – EPA Method 418.1	Total petroleum hydrocarbons

[a] The expanded list of ICP metals included antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lithium, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc in the analytical results package.

EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
IC = ion chromatography
ICP = inductively coupled plasma
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons
VOA = volatile organic analysis

Confirmatory Sampling Results

The focused sampling results were evaluated using the maximum detected result for each COPC and comparing the value directly to the cleanup level. All confirmatory focused sample results are provided as an attachment to the Relative Percent Difference (RPD) and Direct Contact Hazard Quotient and Carcinogenic Risk calculation in Appendix B.

Based on the evaluation of the confirmatory sampling results it was concluded that remediation was required at focused sample location 15 (EPA 2012). The TPH result of 1,300 mg/kg is much higher than the direct exposure cleanup level of 200 mg/kg, at sample location 15. Location 15 is near the center of the Loewy extrusion press pit, and, according to a description of the press room in the confirmatory work instruction, a "floor sump was used to contain used hydraulic oil" (WCH 2008b). Given the presence of the Loewy hydraulic extrusion press in this area, it is possible that the high TPH result is due to the accumulation of leaking hydraulic fluid.

REMEDIATION AT THE PRESS PIT

Remediation at the 300-32 waste site was performed on January 3, 2013, and included removal of 1 m (3.3 ft) of soil surrounding the entire perimeter of the remaining press pit concrete foundation (Figure 3). The removal extended 1 m (3.3 ft) from the perimeter of the Loewy press pit concrete foundation. The final depth of removal for soil surrounding the concrete foundation was 2 m (6.6 ft). All soil was direct loaded for disposal at ERDF. No stained concrete or soil was observed during additional remediation.

The remediation at the Loewy press pit area at the 300-32 waste site resulted in approximately 398 bank cubic meters (521 bank cubic yards) of contaminated soil and debris being removed. All material was direct loaded for disposal at ERDF. Photographs of 300-32 waste site remediation are presented in Appendix A, in chronological order.

RADIOLOGICAL SURVEYS

The initial Global Positioning Environmental Radiological Surveyor (GPERS) survey was performed on January 6, 2012, within the 300-32 waste site following 333 Building slab removal. Gamma surveying did not detect any elevated readings (above background levels). A survey map of the GPERS results is provided in Figure 4.

Figure 3. The 300-32 Waste Site and Loewy Press Pit Remediation Boundary.

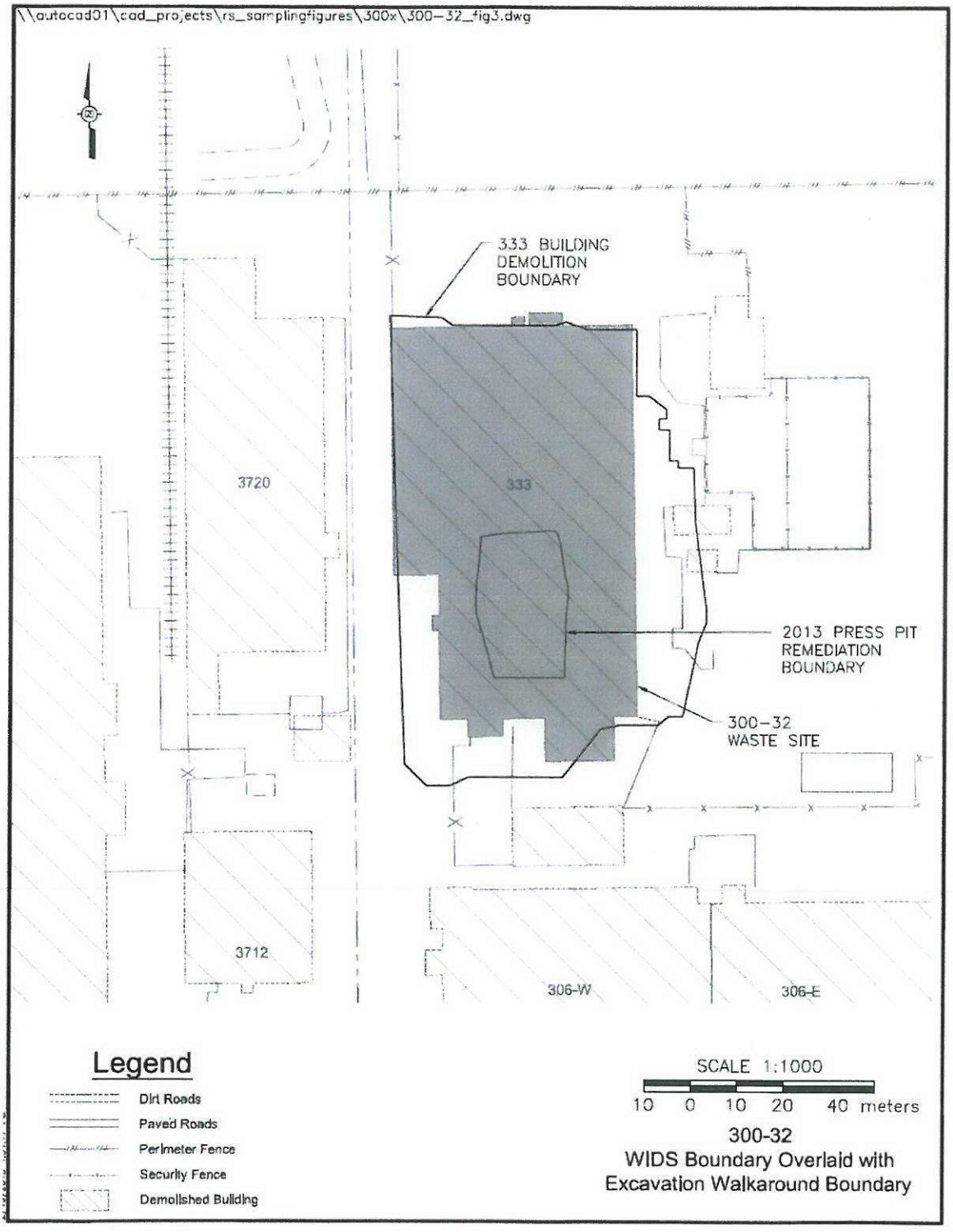
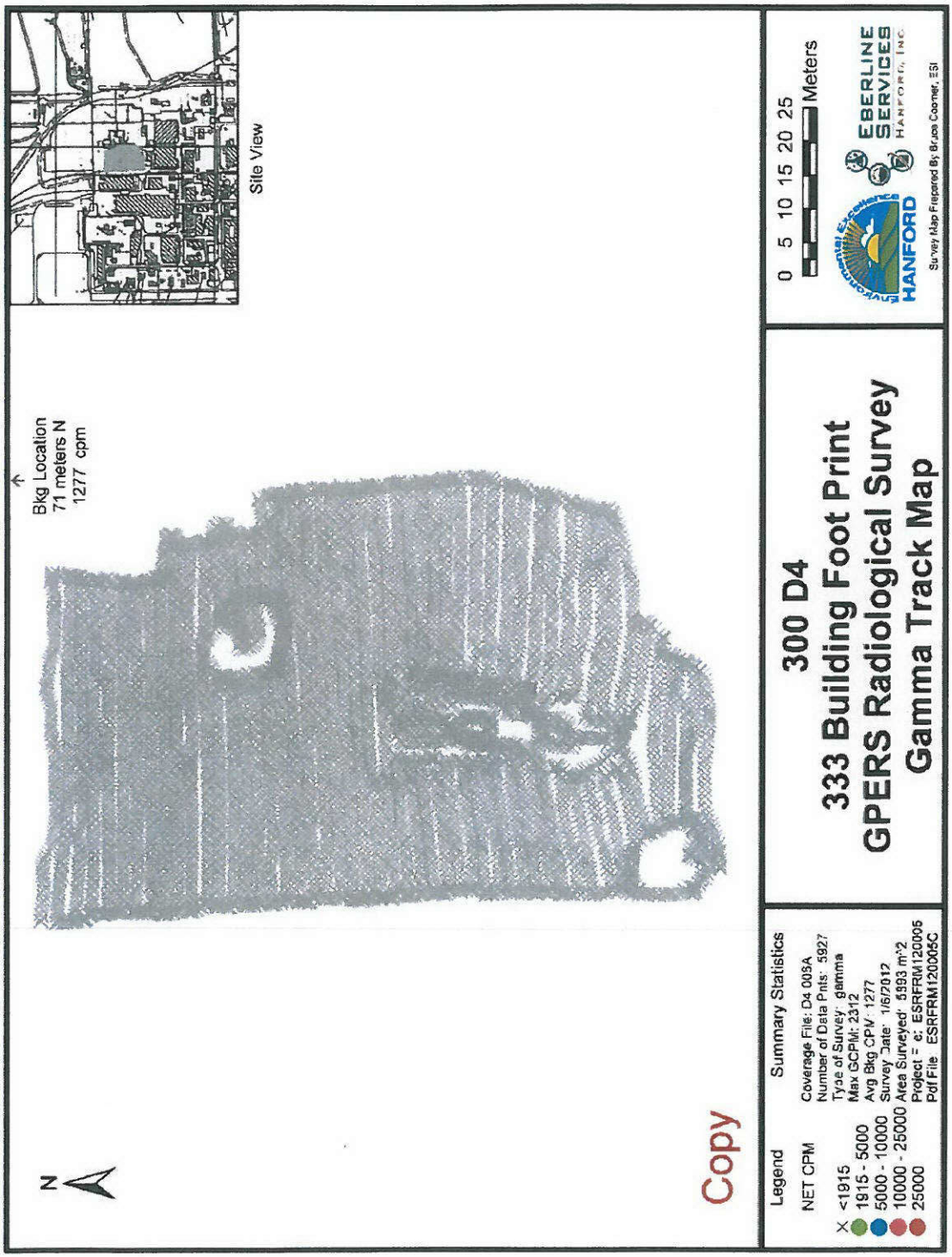


Figure 4. The 300-32 Waste Site Gamma Track Map.



Radiological field screening for beta activity was conducted at the 300-32 waste site on January 5, 2013, using direct survey techniques, transferability surveys and technical smears. The survey was performed for down posting purposes, screening the excavation area, concrete monolith and pipe penetrations. No fixed or removable contamination was found. Beta survey activity of 12,000 dpm/100 cm^2 was identified at a single location. However, it was determined that this was due to a metal shard present inside the excavation. Following the removal of the metal shard, a verification radiological screening survey was performed. The survey results did not indicate any significant residual beta radiological activity. The verification radiological screening survey is included in the "EPA Concurrence to Backfill 300-32" (EPA 2013).

VERIFICATION SAMPLING ACTIVITIES

Following the completion of remediation, verification sampling was performed to evaluate residual contamination and determine if the site meets the cleanup criteria as specified in the 300 Area RDR/RAWP (DOE/RL 2009). A focused sampling approach was combined with composite sampling to evaluate the soils surrounding the Loewy press pit foundation following additional remediation (WCH 2012). All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management procedures*, consistent with the *300 Area Remedial Action Sampling and Analysis Plan* (DOE/RL 2011b). The verification sample data was evaluated in combination with the confirmatory sample data.

The excavated area surrounding the press pit foundation was divided into two equal halves for sampling purposes. One composite sample was collected from each half of the excavated area (Figure 5). Each sample consisted of 25 aliquots collected across the surface of each half of the excavation.

In addition, one focused soil sample was collected from sample location 15, which had exceeded the TPH remedial action goals during confirmatory sampling. This focused sample was collected at Washington State Plane coordinates N 116217, E 593966. In sum, two composite samples, and one focused sample, were submitted for full protocol analysis for TPH only. A complete summary of the sample locations, including confirmatory and verification sampling, is presented in Table 2, and shown in Figure 6.

Figure 5. Remedial Design Sketch and Composite Sampling.

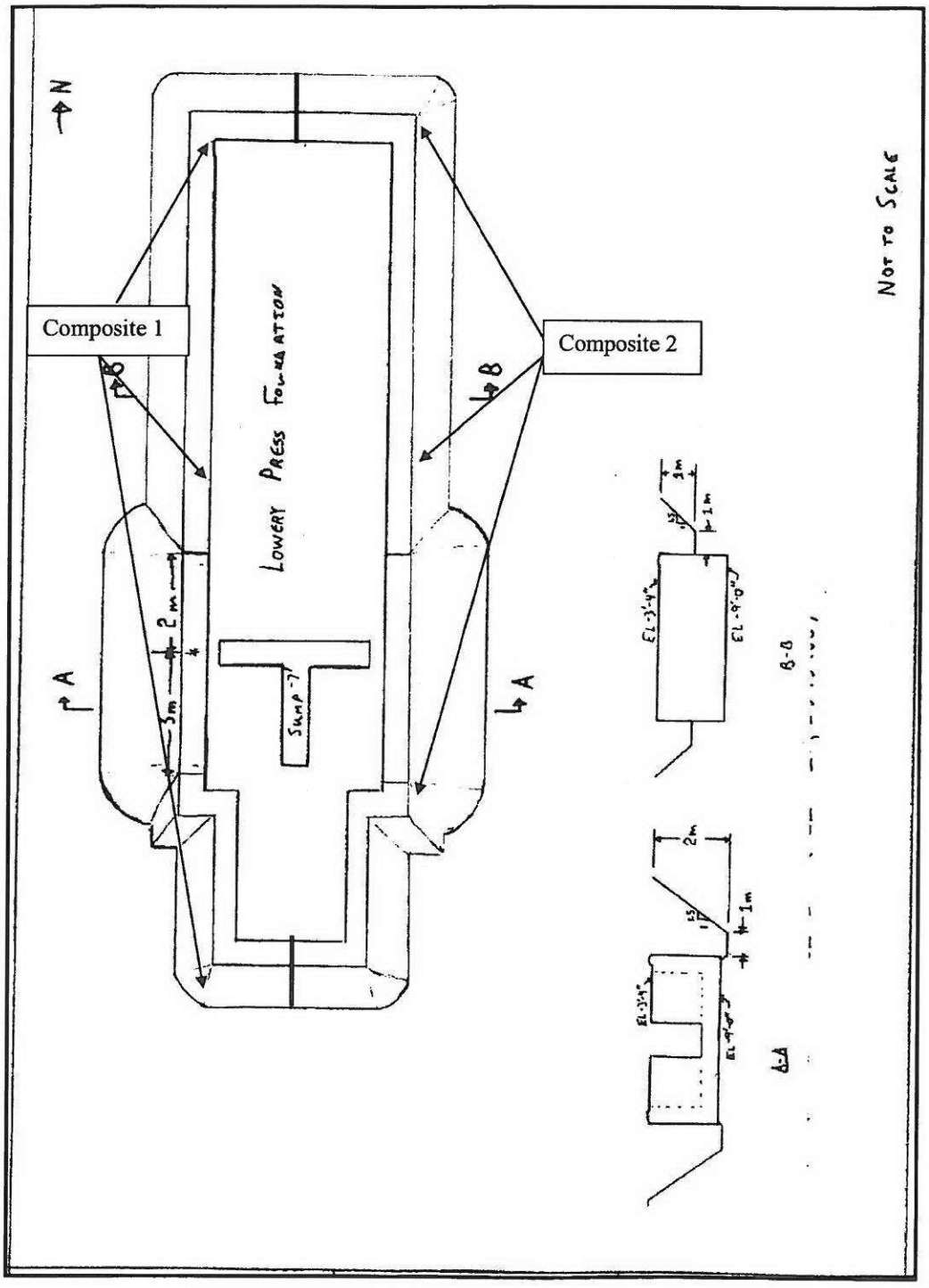


Table 2. 300-32 Sample Summary Table. (2 Pages)

Sample Identification	Sample Location	Sample Media	HEIS Number	Washington State Plane Coordinates (m)		Sample Date	Sample Analysis
Location 1	Tank 11	Surface soil (at 1 m bgs depth)	J1N1M1	N 116231	E 593951	1/9/2012	Anions, nitrite/nitrate, TPH, ICP metals [a], hexavalent chromium, mercury, PCBs, gross alpha, gross beta, GEA, isotopic uranium, uranium (total), SVOA, PAH, and VOA
Location 2	Under WATS trench, west intersection		J1N1M2	N 116237	E 593952		
Location 3	Under WATS trench, west intersection inside chem bay		J1N1M3	N 116237	E 593959		
Location 4	Under WATS trench, west-center intersection inside chem bay		J1N1M4	N 116237	E 593965		
Location 5	Under WATS trench, east-center intersection inside chem bay		J1N1M5	N 116237	E 593971		
Location 6	Under WATS trench, east intersection inside chem bay		J1N1M6	N 116237	E 593977		
Location 7	Under WATS trench, east of chem bay		J1N1M7	N 116237	E 593985		
Location 8	Under WATS trench, intersection near west wall		J1N1M8	N 116237	E 593991		
Location 9	Sump near east wall		J1N1M9	N 116233	E 593991		
Location 10	Sump near autoclave pit		J1N1N0	N 116267	E 593976		
Location 11	Sump near west wall		J1N1N4	N 116219	E 593950	1/10/2012	
Location 12	Sump near chem bay		J1N1N5	N 116245	E 593974		
Location 13	Sump in beta heat treat area		J1N1N6	N 116198	E 593980		
Location 14	South end of autoclave pit		J1N1N7	N 116250	E 593980		
Location 15[b]	Near center of extrusion press pit		J1N1N8	N 116217	E 593966		
Resample of J1N1N8	Post remediation sample	Soil at 2 m bgs	J1R866	N 116217	E 593966	1/3/2013	TPH

Table 2. 300-32 Sample Summary Table. (2 Pages)

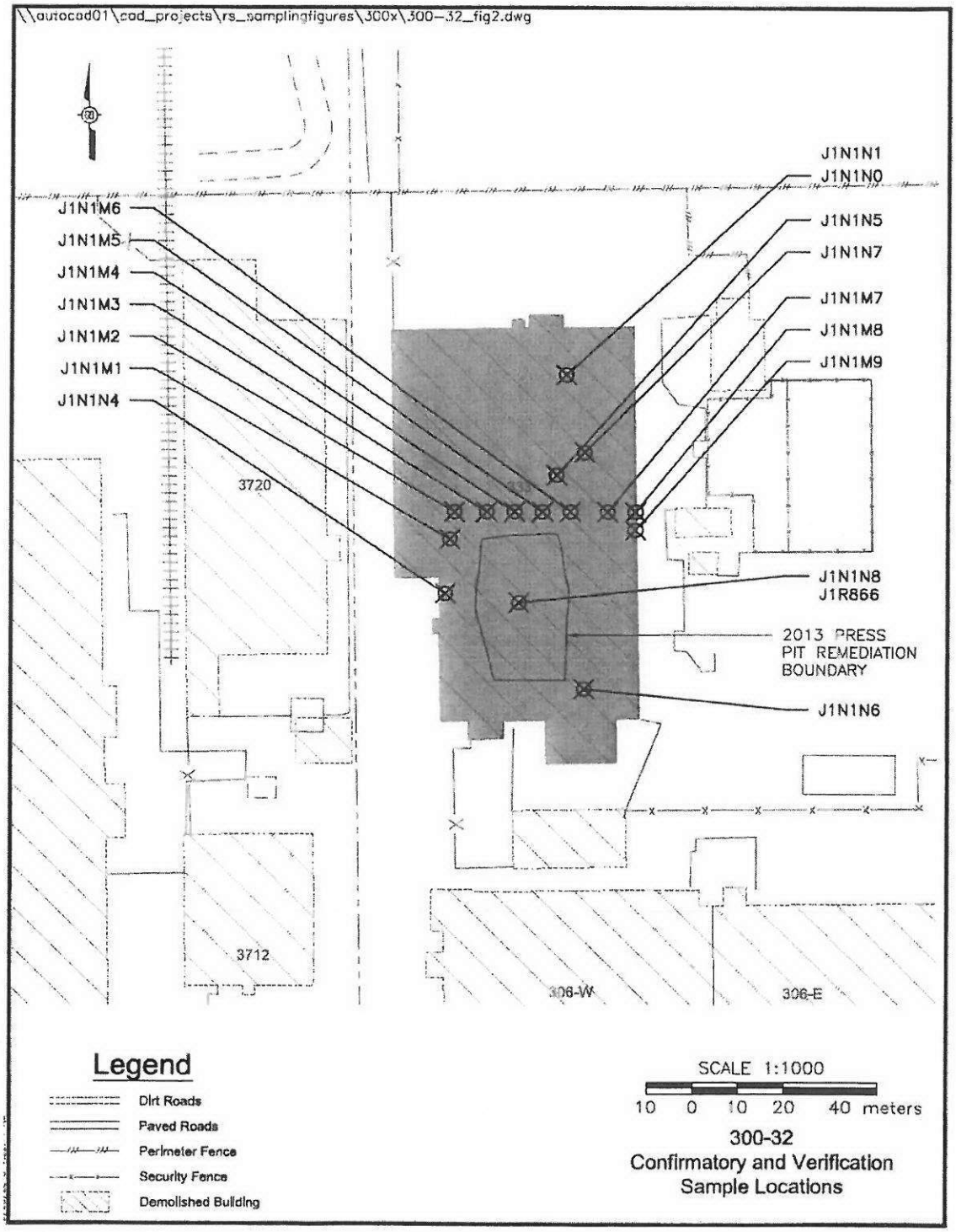
Sample Identification	Sample Location	Sample Media	HEIS Number	Washington State Plane Coordinates (m)		Sample Date	Sample Analysis
Comp-1	Composite-1 west (Press pit post remediation)	Soil 1-2 m bgs	J1R867	NA	NA	1/3/2013	TPH
Comp-2	Composite-2 east (Press pit post remediation)	Soil 1-2 m bgs	J1R868	NA	NA	1/3/2013	TPH
Duplicate of J1N1N0	Location 10	Surface soil	J1N1N1	N 116267	E 593976	1/9/2012	Same analytical list as corresponding primary sample
Equipment blank	NA	Silica sand	J1N1N3	NA	NA	1/10/2012	ICP metals [a], SVOA, and mercury
Trip blank	NA	Silica sand	J1N1M0	NA	NA	1/9/2012	VOA
Trip blank	NA	Silica sand	J1N1N2	NA	NA	1/10/2012	VOA

[a] The expanded list of ICP metals was performed to include antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, lithium, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc in the analytical results package.

[b] Sample location 15 near the center of the base of the Loewy extrusion press was moved approximately 1 m (3 ft) to the west due to the concrete slab. Due to elevated TPH in the confirmatory sample, this location underwent remediation with verification sampling for TPH only.

bgs = below ground surface
GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons
VOA = volatile organic analysis
WATS = Waste Acid Treatment System

Figure 6. The 300-32 Waste Site Confirmatory and Verification Sample Locations.



CONFIRMATORY AND VERIFICATION SAMPLE RESULTS

Confirmatory and verification samples were analyzed using EPA-approved analytical methods. Comparisons of the maximum results for COPCs against the residential site RAGs for focused samples of the 300-32 waste site are summarized in Table 3. Contaminants that were not detected by laboratory analysis are excluded from this table, but are reported in Appendix B. Calculated cleanup levels are not presented in the Cleanup Levels and Risk Calculations Database (Ecology 2013) under *WAC* 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COPCs and are not included in these tables.

The laboratory-reported confirmatory and verification data results for all constituents are stored in the Environmental Restoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS) and are presented as an attachment of the RPD and Direct Hazard Quotient and Carcinogenic Risk calculation (Appendix B).

VERIFICATION SAMPLE DATA EVALUATION

This section demonstrates that contaminant concentrations at the 300-32 waste site achieve the applicable RAGs developed to support residential land use in the 300 Area as established in the 300-FF-2 ROD (EPA 2001) and documented in the RDR/RAWP (DOE-RL 2009). Table 3 compares the confirmatory and verification focused sample results to the applicable soil RAGs for unrestricted direct exposure, protection of groundwater, and protection of the Columbia River.

Attainment of Radionuclide Residential Direct Exposure RAGs

Table 4 compares the radionuclide confirmatory and verification results for the focused data set to direct exposure single radionuclide 15 mrem/yr dose-equivalence values and shows the sum of fractions evaluation for comparison of the total radionuclide dose to the RAG of 15 mrem/yr. The columns on the left side of the tables are the COPCs and the radionuclide activities corrected for background, as appropriate. The third column presents the single radionuclide 15 mrem/yr dose-equivalence activities, and the last column presents the radionuclide activities divided by the dose-equivalence activities. As demonstrated by the summation of these fractions, the cumulative dose contributed by residual radionuclide populations will be less than the 15 mrem/yr RAG at 7.87 mrem/yr.

Table 3. Comparison of Maximum Contaminant Concentrations to Remedial Action Goals for the 300-32 Waste Site Confirmatory and Verification Samples. (2 Pages)

COPC	Maximum Result (pCi/g)	Soil Lookup Values [a] (pCi/g)			Does the Maximum Result Exceed RAGs?	Do the Results Pass RESRAD Modeling?
		Unrestricted Direct Exposure	Unrestricted Protective of Groundwater	Unrestricted Protective of the River		
Uranium-233/234	7.32	27.2	17.9	17.9	No	--
Uranium-235	0.342	2.7	1.8	1.8	No	--
Uranium-238	6.59	26.2	17.3	17.3	No	--
COPC	**Maximum Result (mg/kg)**	**Soil Cleanup Levels [a] (mg/kg)**			**Does the Maximum Result Exceed RAGs?**	**Do the Results Pass RESRAD Modeling?**
		Unrestricted Direct Exposure	**Protective of Groundwater**	**Protective of the River**		
Arsenic	3.84 (<BG)	20 [b]	20 [b]	20 [b]	No	--
Barium	95.7 (<BG)	1,600 [c]	200	400	No	--
Beryllium	0.270 (<BG)	10.4 [c]	1.51 [d]	1.51 [d]	No	--
Boron [e]	4.87	16,000	320	NA	No	--
Cadmium	0.189 (<BG)	13.9 [c]	0.81 [d]	0.81 [d]	No	--
Chromium (total)	9.41 (<BG)	120,000	18.5 [d]	18.5 [d]	No	--
Cobalt	5.54 (<BG)	24	15.7 [d]	NA	No	--
Copper	21.3 (<BG)	2,960	59.2	22.0 [d]	No	--
Lead	13.4	353	NA [f]	NA [f]	No	--
Lithium	6.64 (<BG)	160	33.5 [d]	NA	No	--
Manganese	308 (<BG)	3,700	512 [d]	512 [d]	No	--
Molybdenum [e]	0.736	400	8	NA	No	--
Nickel	8.71 (<BG)	1,600	19.1 [d]	27.4	No	--
Uranium	21.4	81	53	106	No	--
Vanadium	45.2 (<BG)	560	85.1 [d]	NA	No	--
Zinc	45.7 (<BG)	24,000	480	67.8 [d]	No	--
Chloride	312	NA	25,000	NA	No	--
Fluoride	1.1 (<BG)	4,800	96	400	No	--
Nitrate (as nitrogen)	16.3	8,000	1,000	2,000	No	--
Sulfate	246	NA	25,000	NA	No	--
TPH – diesel range	1.18	200	200	200	No	--
TPH – motor oil	106	200	200	200	No	--
Acetone	0.0422	72,000	720	NA	No	--
Acenaphthene	0.0977	4,800	96	129	No	--
Acenaphthylene [g]	0.00719	4,800	96	129	No	--
Aroclor-1248	0.0365	0.5	0.017 [f]	0.017 [f]	Yes	Yes [h]
Aroclor-1254	0.318	0.5	0.017 [f]	0.017 [f]	Yes	Yes [h]
Aroclor-1260	0.0962	0.5	0.017 [f]	0.017 [f]	Yes	Yes [h]
Total PCBs	0.451	0.5	0.017 [f]	0.017 [f]	Yes	Yes [h]
Benzo(a)anthracene	0.0456	1.37	0.015 [f]	0.015 [f]	Yes	Yes [h]
Benzo(a)pyrene	0.0122	0.137	0.015 [f]	0.015 [f]	No	--
Benzo(b)fluoranthene	0.0130	1.37	0.015 [f]	0.015 [f]	No	--
Benzo(ghi)perylene [g]	0.00540	2,400	48	192	No	--
Benzo(k)fluoranthene	0.0186	1.37	0.015 [f]	0.015 [f]	Yes	Yes [h]
Chrysene	0.0850	13.7	0.12	0.1 [f]	No	--
Di-n-butylphthalate	0.249	8,000	160	540	No	--

Table 3. Comparison of Maximum Contaminant Concentrations to Remedial Action Goals for the 300-32 Waste Site Confirmatory and Verification Samples. (2 Pages)

COPC	Maximum Result (mg/kg)	Soil Cleanup Levels [a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Do the Results Pass RESRAD Modeling?
		Unrestricted Direct Exposure	Protective of Groundwater	Protective of the River		
Fluoranthene	0.218	3,200	64	18.0	No	--
Fluorene	0.0415	3,200	64	260	No	--
Indeno(1,2,3-cd)pyrene	0.00908	1.37	0.33 [f]	0.33 [f]	No	--
Naphthalene	0.108	1,600	16.0	988	No	--
Phenanthrene [g]	0.00719	24,000	240	1,920	No	--
Pyrene	0.00903	2,400	48	192	No	--

[a] Lookup values and RAGs obtained from the RDR/RAWP (DOE-RL 2009) as amended by Tri-Party Agreement Change Notice TPA-CN-407 (DOE-RL 2010) unless otherwise noted.
[b] The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers.
[c] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3]) (Ecology 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (WDOH 1997).
[d] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d) (Ecology 1996).
[e] No Hanford Site-specific or Washington State background value available.
[f] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per Ecology (1996), WAC 173-340-707(2).
[g] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
Contaminant: acenaphthylene; surrogate: acenaphthene
Contaminant: benzo(g,h,i)perylene; surrogate: pyrene
Contaminant: phenathrene; surrogate: anthracene.
[h] Based on RESRAD modeling using input parameters and soil-partitioning coefficients from the RDR/RAWP (DOE-RL 2009) for an unrestricted land use scenario, residual concentrations of aroclor-1248, aroclor-1254, aroclor-1260, benzo(a)anthracene, and benzo(k)fluoranthene are not expected to migrate more than 1 m (3.3 ft) vertically in 1,000 years (based on the contaminant with the lowest distribution coefficient [aroclor-1248] of 43.9 mL/g). The vadose zone underlying the soil below the site is approximately 14 m (46 ft) thick based on an elevation at the 300-32 waste site of 119 m (391 ft) and a groundwater elevation of approximately 105 m (344 ft). Therefore, residual concentrations of aroclor-1248, aroclor-1254, aroclor-1260, benzo(a)anthracene, and benzo(k)fluoranthene are predicted to be protective of groundwater and the Columbia River.

-- = not applicable
BG = background
COPC = contaminant of potential concern
NA = not applicable
PCB = polychlorinated biphenyls
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 300 Area*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 4. Attainment of Radionuclide Unrestricted Direct Exposure Remedial Action Goals (Focused Samples).

Contaminants of Potential Concern	Focused Sample Analytical Values above Background (pCi/g)	Activity Equivalent to 15 mrem/yr Unrestricted Dose [a] (pCi/g)	Fraction
Uranium-234	6.22	27.2	0.229
Uranium-235	0.232	2.7	0.0859
Uranium-238	5.49	26.2	0.210
		Total	0.525
		Equivalent Dose (mrem/yr)	7.87

[a] Single radionuclide 15 mrem/yr dose-equivalence values and derivation methodology are presented in DOE/RL-2001-47, *Remedial Design Report/Remedial Action Work Plan for the 300 Area* (DOE-RL 2009).

Nonradionuclide Direct Contact Hazard Quotient and Carcinogenic Risk RAGs Attained

Nonradionuclide risk requirements include individual hazard quotients of less than 1.0, a cumulative hazard quotient of less than 1.0, an individual contaminant carcinogenic risk of less than 1×10^{-6}, and a cumulative carcinogenic risk of less than 1×10^{-5}. For the 300-32 waste site, these risk values were not calculated for constituents that were either not detected or were detected at concentrations below Hanford Site or Washington State background levels. All individual hazard quotients for noncarcinogenic constituents were less than 1.0. The cumulative hazard quotient for those noncarcinogenic constituents above background or detected levels is 3.8×10^{-1}. The carcinogenic risk value for the carcinogenic constituents above background or detected levels is 7.9×10^{-7}, which is less than the criteria of 1×10^{-5}.

Nonradionuclide Soil RAGs for Groundwater and River Protection Attained

Evaluation of the results listed in Table 3 from the confirmatory and verification sampling at the 300-32 waste site indicated that all nonradionuclide COPCs were undetected and/or quantified below RAGs and lookup values, except for aroclor-1248, aroclor-1254, aroclor-1260, total PCBs, benzo(a)anthracene, benzo(a)pyrene and benzo(k)fluoranthene. Residual concentrations of these constituents exceeded soil RAGs for the protection of groundwater and/or the Columbia River. Data were not collected on the vertical extent of these contaminants, but based on RESidual RADioactivity (RESRAD) input parameters and soil-partitioning coefficients for unrestricted land use from Appendix B, Table B-8b, of the 300 Area RDR/RAWP (DOE-RL 2009), constituents with soil-partitioning coefficients greater than 26 mL/g are predicted to show less than 1 m (3.3 ft) migration through vadose zone soil. The lowest soil-partitioning coefficient of the contaminants exceeding the RAGs, aroclor-1248, is 43.9 mL/g, and the vadose zone beneath the deepest excavation point of the 300-32 waste site is approximately 14 m (46 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the confirmatory and verification sampling approach (WCH 2013a), the field logbooks (WCH 2012, WCH 2013b), and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications.

The DQA for the 300-32 waste site established that the data are of the right type, quality, and quantity to support site verification decisions within specified error tolerances. The evaluation verified that the sample design was sufficient for the purpose of clean site verification. The cleanup confirmatory and verification sample analytical data are stored in the ENRE project-specific database for data evaluation prior to archival in the HEIS and are provided as an attachment to the Relative Percent Difference (RPD) and Direct Contact Hazard Quotient and Carcinogenic Risk calculation in Appendix B. The detailed DQA is presented in Appendix C.

SUMMARY FOR INTERIM CLOSURE

The 300-32 waste site has been evaluated in accordance with the 300-FF-2 ROD (EPA 2001) and the RDR/RAWP (DOE-RL 2009). Confirmatory and verification sampling was performed, and the analytical results indicate that the residual concentrations of COPCs at this site meet the RAGs and corresponding RAOs for direct exposure, groundwater protection, and river protection. In accordance with this evaluation, the confirmatory and verification sampling results support a reclassification of the 300-32 waste site to Interim Closed Out. These results show that residual soil concentrations support future land uses that can be represented (or bounded) by an unrestricted land-use scenario and are protective of groundwater and the Columbia River. The 300-32 waste site meets the RAGs and RAOs for unrestricted land use; therefore, no institutional controls to maintain industrial land use of the site are required.

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APPENDIX A

333 BUILDING, 333 BUILDING SLAB AND 300-32 WASTE SITE POST-REMEDIATION PHOTOGRAPHS

Figure A-1. Areal Photograph of the 333 Building in 1982 (Looking Northeast).

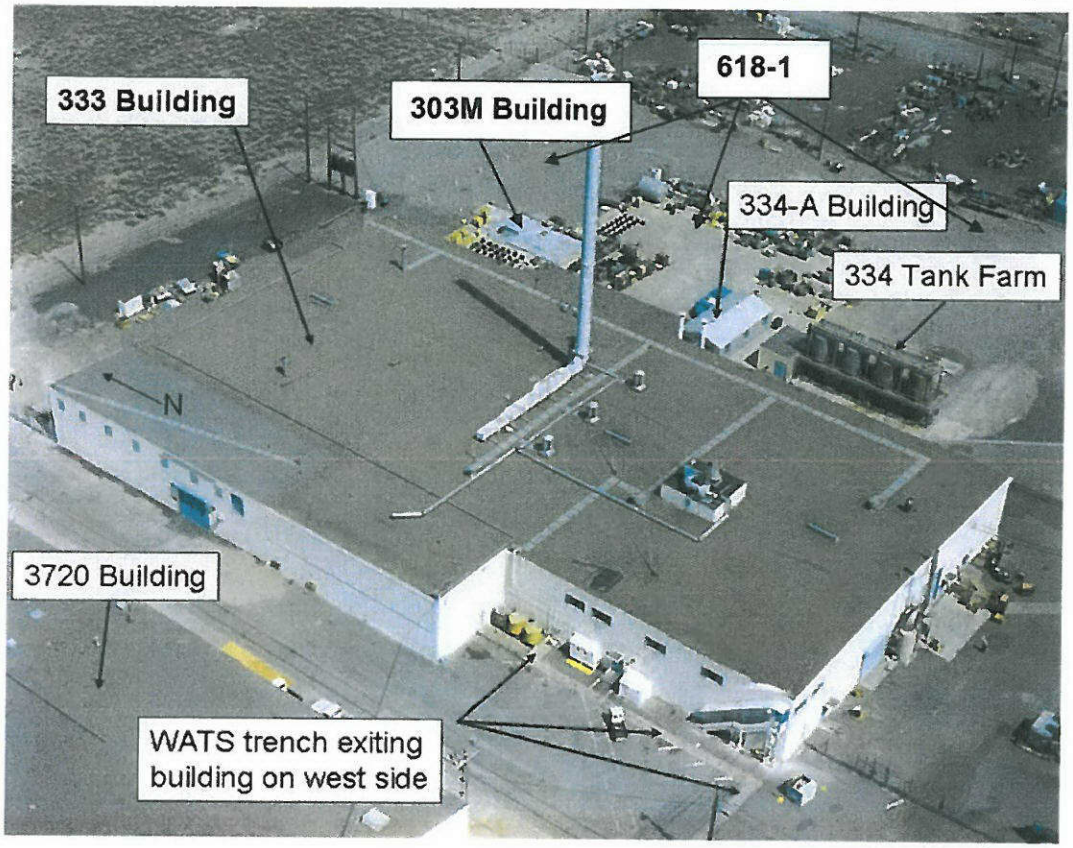
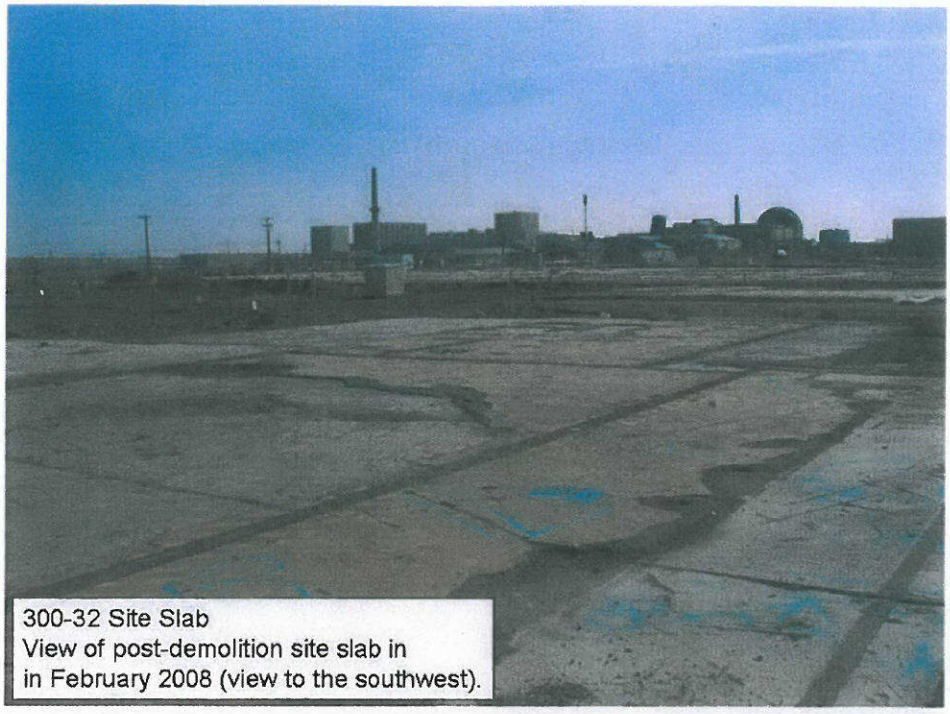
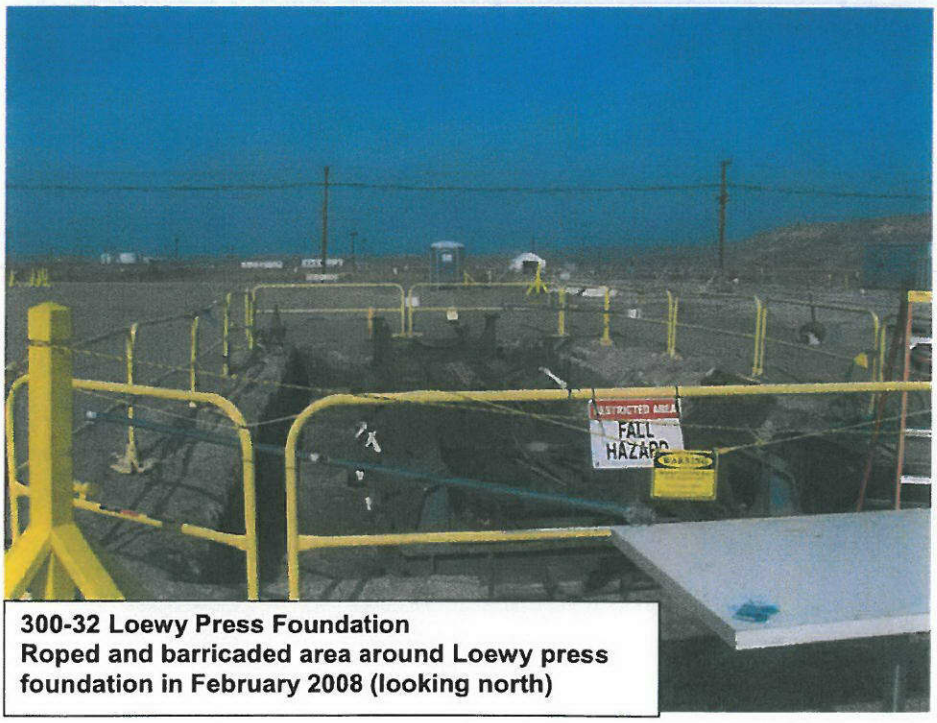


Figure A-2. A Portion of the 300-32 Waste Site Slab in 2008.



300-32 Site Slab
View of post-demolition site slab in
in February 2008 (view to the southwest).

Figure A-3. The 300-32 Waste Site Loewy Press Pit in 2008.



300-32 Loewy Press Foundation
Roped and barricaded area around Loewy press foundation in February 2008 (looking north)

Figure A-4. Areal Photograph of the 300-32 Waste Site in 2011 (Looking Southeast).

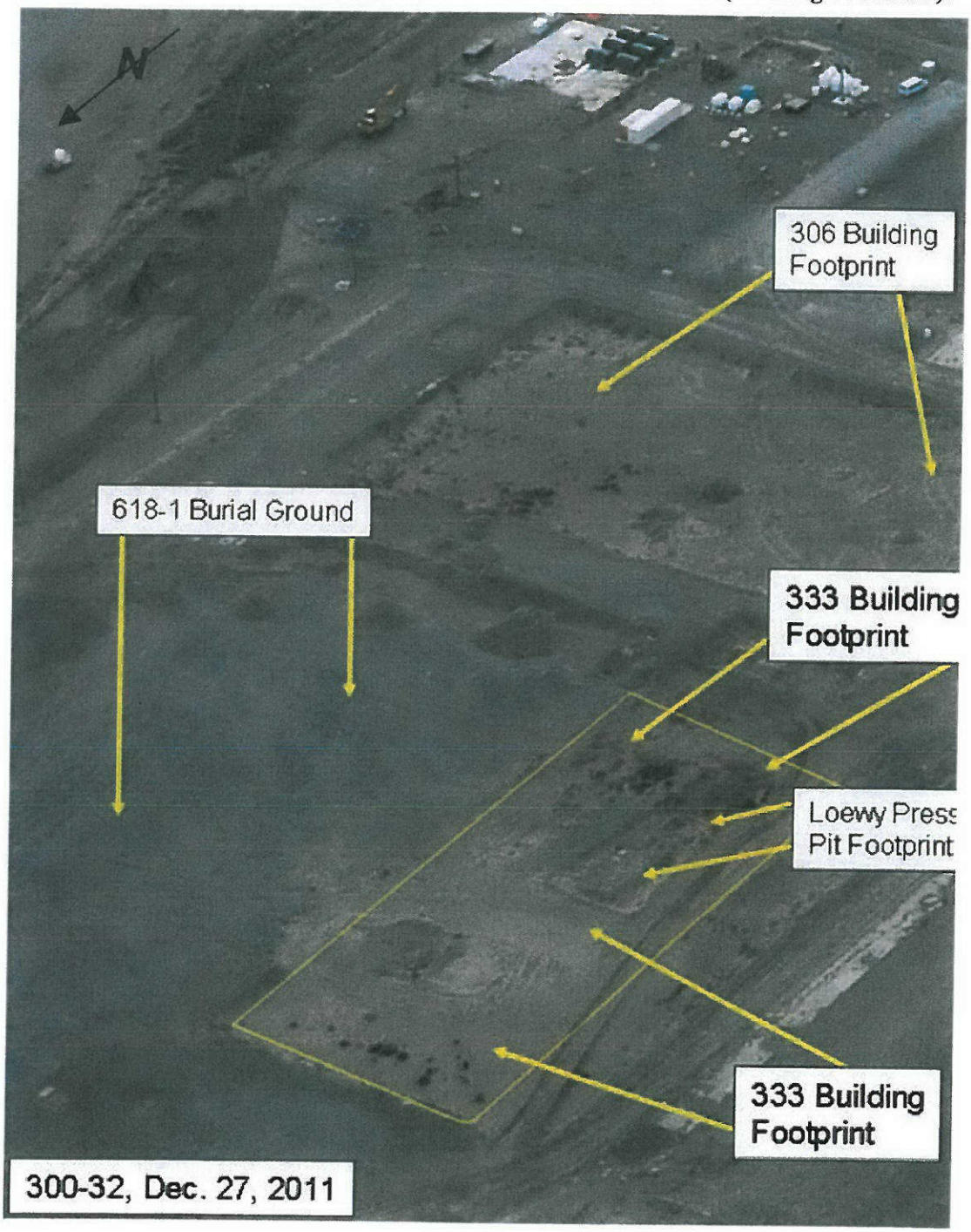


Figure A-5. The 300-32 Waste Site on February 6, 2012, Site Visit (Looking North).

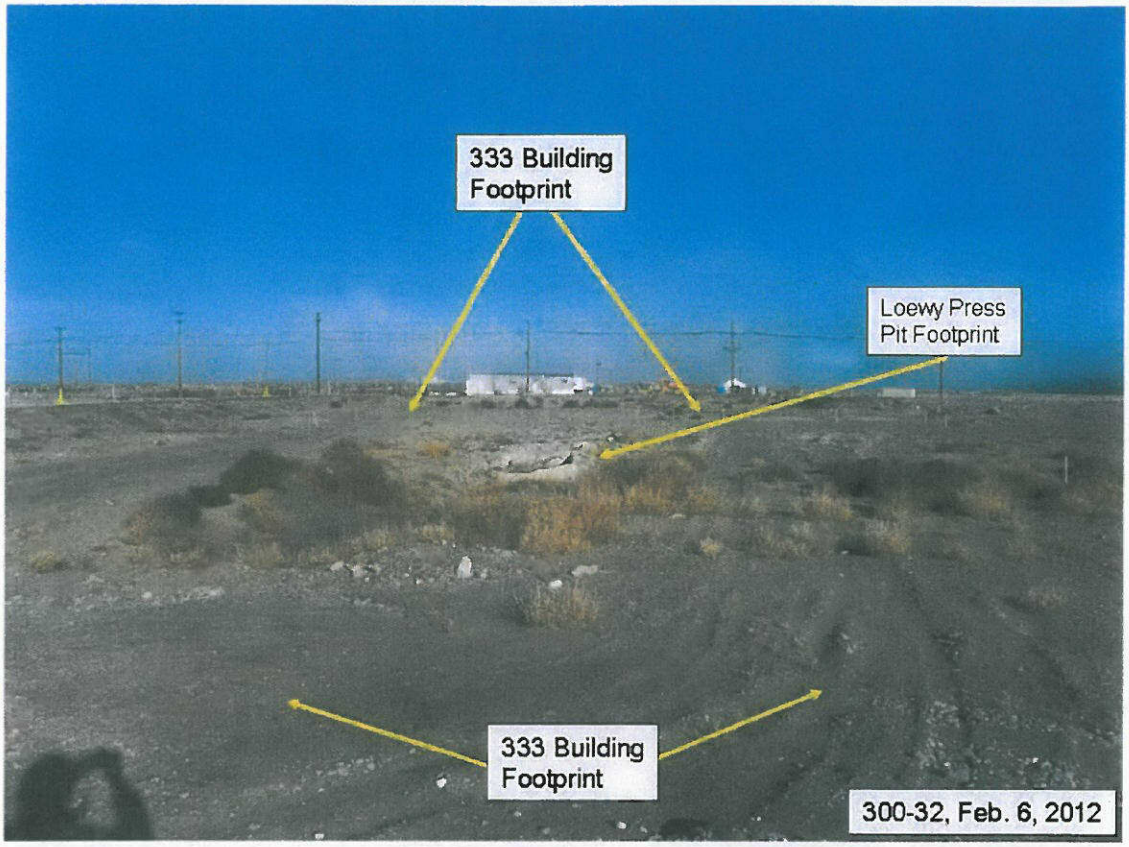
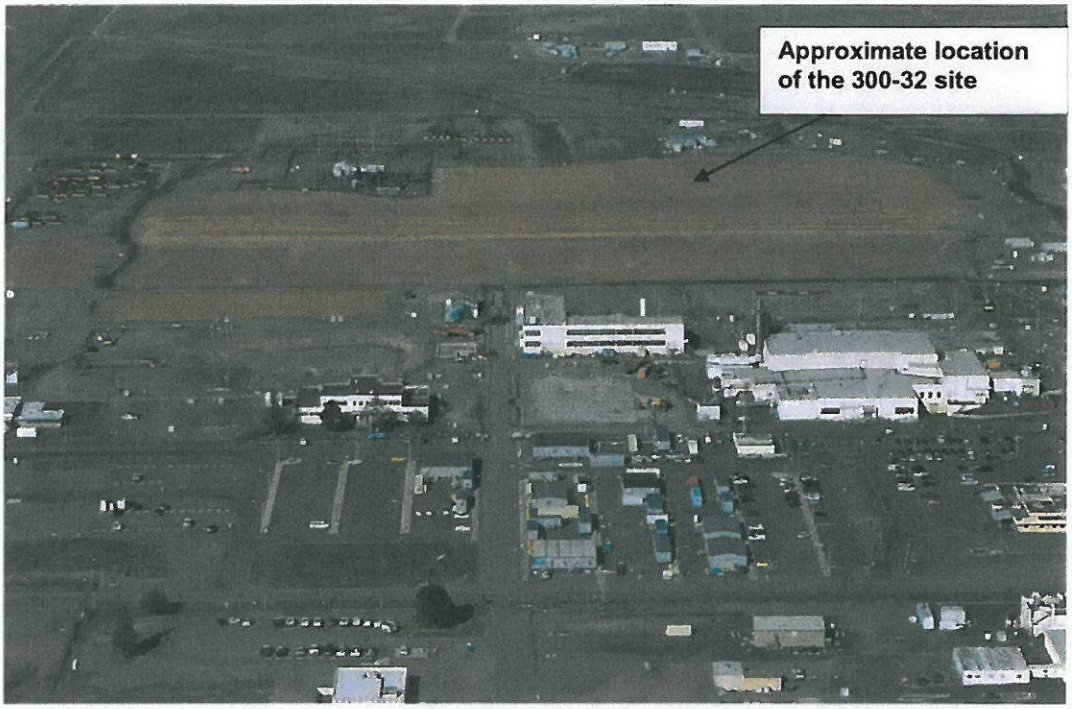


Figure A-6. The 300-32 Waste Site Post-Excavation Photograph, Looking North (January 3, 2013).

Figure A-7. The 300-32 Waste Site Post-Excavation Photograph, Looking Northwest (January 3, 2013).

Figure A-8. Aerial Photograph of the 300-32 Waste Site Location Backfilled and Revegetated. Looking North (February 1, 2013).



APPENDIX B

RELATIVE PERCENT DIFFERENCE (RPD), DIRECT CONTACT HAZARD QUOTIENT, AND CARCINOGENIC RISK CALCULATIONS

APPENDIX B

CALCULATION BRIEF

The calculations in this appendix are kept in the active Washington Closure Hanford project files and are available upon request. When the project is completed, the file will be stored in a U.S. Department of Energy, Richland Operations Office repository. This calculation has been prepared in accordance with ENG-1, *Engineering Services*, ENG-1-4.5, "Project Calculation," Washington Closure Hanford, Richland, Washington. The following calculations are provided in this appendix:

300-32 *Waste Site Relative Percent Difference (RPD) and Direct Contact Hazard Quotient and Carcinogenic Risk Calculation,* 0300X-CA-V0167, Rev. 0, Washington Closure Hanford, Richland, Washington.

DISCLAIMER FOR CALCULATIONS

The calculations that are provided in this appendix have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

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CALCULATION COVER SHEET

Project Title: 300 Area Field Remediation **Job No. 14655**

Area: 300 Area Remaining Sites

Discipline: Environmental Calculation No: 0300X-CA-V0167

Subject: 300-32 Waste Site Relative Percent Difference (RPD) and Direct Contact Hazard Quotient and Carcinogenic Risk Calculation

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 7 Attachment 1 = 16 Total = 24	N. K. Schiffern	I. B. Berezovskiy	J. D. Skoglie	T. Q. Howell	3/25/13

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007)

DE01-437.03

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	N. K. Schiffern	Date:	1/14/2013	Calc. No.:	0300X-CA-V0167	Rev.:	0
Project:	300 Area Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	1/14/2013
Subject:	300-32 Waste Site Relative Percent Difference (RPD) and Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 1 of 7	

PURPOSE:

Provide documentation to support the calculation of the direct contact hazard quotient (HQ) and excess carcinogenic risk for the 300-32 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

Also, calculate the relative percent difference (RPD) for primary-duplicate and sample pairs from the 300-32 waste site verification and confirmatory sampling, as necessary.

GIVEN/REFERENCES:

1) DOE-RL, 2009, *Remedial Design Report/Remedial Action Work Plan for the 300 Area*, DOE/RL-2001-47, Rev. 3, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) DOE-RL, 2011, *300 Area Remedial Action Sampling and Analysis Plan*, DOE/RL-2001-48, Rev. 3, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) EPA, 1994, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-94/013, U.S. Environmental Protection Agency, Washington, D.C.

4) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

5) WCH, 2013, *Remaining Sites Verification Package for the 300-32, 333 Building 333N Fuels Manufacturing Building; New Fuel Cladding Facility, 333 Building Remaining Soils Waste Site*, Attachment to Waste Site Reclassification Form 2013-06, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate an HQ for each noncarcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the individual HQ of <1.0 (DOE-RL 2009).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

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Project:	300 Area Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	3/25/2013
Subject:	300-32 Waste Site Relative Percent Difference (RPD) and Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 7	

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the excess cancer risk of $<1 \times 10^{-6}$ (DOE-RL 2009).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

5) Use data from WCH (2013) to perform the RPD calculations for primary-duplicate sample pairs, as required.

METHODOLOGY:

The 300-32 waste site underwent verification and confirmatory sampling at one decision unit. Fifteen focused samples were collected from this waste site. Also taken were one duplicate sample, two composite samples, one equipment blank, and two trip blanks. The direct contact hazard quotient and carcinogenic risk calculations for the 300-32 waste site were conservatively calculated for the entire waste site using the greatest of the maximum soil sample results (WCH 2013). Of the contaminants of potential concern (COPCs) for this waste site, uranium and nitrogen in nitrate require HQ and risk calculations because these analytes were detected above background values. Boron, molybdenum, detected polycyclic aromatic hydrocarbons (PAHs), detected polychlorinated biphenyls (PCB), di-n-butylphthalate, and acetone require HQ and risk calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. Lead was detected above background; however, lead does not have a reference dose for calculation of a hazard quotient because toxic effects of lead are correlated with blood-lead levels rather than exposure levels or daily intake. Although total petroleum hydrocarbons (diesel range plus motor oil) were detected and no background value is available, the risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation. All other site nonradionuclide COPCs were not detected or were quantified below background levels. The entire data set was evaluated against the residential HQ and risk standards. An example of the HQ and risk calculations is presented below:

1) For example, the maximum value for boron is 4.87 mg/kg, divided by the noncarcinogenic RAG value of 16,000 mg/kg (calculated in accordance with the noncarcinogenic toxics effects formula in WAC 173-340-740[3]), produces an HQ value of 3.0×10^{-4}. Comparing this value, and all other individual values, to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation. The sum of the HQ values is 3.8×10^{-1}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum value is divided by the carcinogenic RAG value, then multiplied by 1.0×10^{-6}. For example, the maximum value for aroclor-1248 is 0.0365 mg/kg; divided by 0.5 mg/kg, and multiplied as indicated, is 7.3×10^{-8}. Comparing this value to the requirement of $<1 \times 10^{-6}$, this criterion is met.

Washington Closure Hanford, Inc. CALCULATION SHEET

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4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk is obtained by summing the individual values. The excess cancer risk for the carcinogenic constituents detected is 7.9×10^{-7}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

5) The RPD is calculated when both the primary value and the duplicate value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each analytical method and is listed for certain analytes in Table II-1 of the SAP (DOE-RL 2011). Other analytes will have their own pre-determined constituents and will have their own TDLs based on the laboratory and method used. Where direct evaluation of the attached sample data showed that a given analyte was not detected in the primary and/or duplicate sample, further evaluation of the RPD value was not performed. The RPD calculations use the following formula:

$$RPD = [\ |M-D|/((M+D)/2)]*100$$

where, M = main sample value D = duplicate sample value

When an analyte is detected in the primary or duplicate sample, but was quantified at less than 5 times the TDL in one or both samples, an additional parameter is evaluated. In this case, if the difference between the primary and duplicate results exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. This assessment is provided in the data quality assessment section of the RSVP.

For quality assurance/quality control (QA/QC) duplicate RPD calculations, a value less than 30% indicates the data compare favorably. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for regulatory split data), further investigation regarding the usability of the data is performed. No split samples were collected for the confirmatory sampling of the subject site. Additional discussion is provided in the data quality assessment section of the applicable RSVP (WCH 2013), as necessary.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None
2) List the cumulative noncarcinogenic HQ >1.0: None
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None
4) List the cumulative excess cancer risk for carcinogens $>1 \times 10^{-5}$: None

Table 1 shows the results of the residential direct contact calculations.

5) The evaluation of the QA/QC duplicate and split RPD calculations are performed within the data quality assessment section of the RSVP.

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Table 2 shows the results of the RPD calculations for the 300-32 waste site.

Table 1. Residential Direct Contact HQ and Excess Cancer Risk Results for the 300-32 Waste Site. (2 pages)

Contaminants of Potential Concern	Maximum Value[a] (mg/kg)	Residential Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Residential Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Boron	4.87	16,000	3.0E-04	--	--
Lead[c]	13.4	353	--	--	--
Molybdenum	0.736	400	1.8E-03	--	--
Uranium	21.4	81	2.6E-01	--	--
Semivolatiles					
Di-n-butylphthalate	0.249	8,000	3.1E-05	--	--
Anions					
Nitrate as Nitrogen[d]	16.3	8,000	2.0E-03	--	--
Nitrite as Nitrogen[d]	0.46	8,000	5.8E-05	--	--
Total Petroleum Hydrocarbons					
TPH - Diesel and Motor Oil[e]	106	200	--	--	--
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.0977	4,800	2.0E-05	--	--
Acenaphthylene[f]	0.0719	4,800	1.5E-05	--	--
Benzo(a)anthracene	0.0456	--	--	1.37	3.3E-08
Benzo(a)pyrene	0.0122	--	--	0.137	8.9E-08
Benzo(b)fluoranthene	0.0130	--	--	1.37	9.5E-09
Benzo(k)fluoranthene	0.0186	--	--	1.37	1.4E-08
Benzo(ghi)perylene[f]	0.00540	2,400	2.3E-06	--	--
Chrysene	0.0850	--	--	13.7	6.2E-09
Fluoranthene	0.218	3,200	6.8E-05	--	--
Fluorene	0.0415	3,200	1.3E-05	--	--
Indeno(1,2,3-cd)pyrene	0.00908	--	--	1.37	6.6E-09
Naphthalene	0.108	1,600	6.8E-05	--	--
Phenanthrene[f]	0.00719	24,000	3.0E-07	--	--
Pyrene	0.00903	2,400	3.8E-06	--	--
Polychlorinated Biphenyls					
Aroclor-1248	0.0365	--	--	0.5	7.3E-08
Aroclor-1254	0.181	1.6	1.1E-01	0.5	3.6E-07
Aroclor-1260	0.0962	--	--	0.5	1.9E-07

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Table 1. Residential Direct Contact HQ and Excess Cancer Risk Results for the 300-32 Waste Site. (2 pages)

Contaminants of Potential Concern	Maximum Value[a] (mg/kg)	Residential Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Residential Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Volatiles					
Acetone	0.0422	72,000	5.9E-07	--	--
Totals					
Cumulative Hazard Quotient:			**3.8E-01**		
Cumulative Excess Cancer Risk:					**7.9E-07**

Notes:

[a] = From WCH (2013).

[b] = Value obtained from the RDR/RAWP (DOE-RL 2009) or *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.

[c] = Value for the noncarcinogenic RAG calculated using Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, EPA/540/R 93/081, Publication No. 9285.7, U.S. Environmental Protection Agency, Washington, D.C.

[d] = values converted from nitrate and nitrite.

[e] = The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation.

[f] = Toxicity data for these chemicals are not available. The cleanup levels are based on use of surrogate chemicals.

acenaphthylene surrogate: acenaphthene

benzo(g,h,i)perylene surrogate: pyrene

phenanthrene surrogate: anthracene

-- = not applicable

RAG = remedial action goal

Table 2. Relative Percent Difference Calculations for the 300-32 Waste Site. (3 pages)

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Bismuth-214 pCi/g	Q	MDA	Lead-212 pCi/g	Q	MDA	Potassium-40 pCi/g	Q	MDA	Radium-226 pCi/g	Q	PQL
Location 10	J1N1N0	1/9/2012	0.466		0.075	0.979		0.057	19.8		0.366	0.453		0.073
Duplicate of J1N1N0	J1N1N1	1/9/2012	0.410		0.052	0.700		0.037	16.2		0.212	0.398		0.051

Analysis:

TDL		0.25	0.25	0.5	0.1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)
	RPD			20.0%	
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	No - acceptable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Radium-228 pCi/g	Q	MDA	Thorium-228 pCi/g	Q	MDA	Thorium-232 pCi/g	Q	MDA	Uranium-233/234 pCi/g	Q	PQL
Location 10	J1N1N0	1/9/2012	0.853		0.167	0.946		0.055	0.853		0.167	5.60		0.164
Duplicate of J1N1N0	J1N1N1	1/9/2012	0.700		0.114	0.676		0.036	0.700		0.114	3.10		0.173

Analysis:

TDL		0.2	1	1	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD				
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	Yes - assess further

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Project:	300 Area Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	1/28/2013
Subject:	300-32 Waste Site Relative Percent Difference (RPD) and Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	6 of 7

Table 2. Relative Percent Difference Calculations for the 300-32 Waste Site. (3 pages)

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Uranium-235, AEA			Uranium-238, AEA			Gross alpha			Gross beta		
			pCi/g	Q	PQL	pCi/g	Q	PQL	pCi/g	Q	PQL	pCi/g	Q	PQL
Location 10	J1N1N0	1/9/2012	0.234	J	0.199	5.13		0.164	16.1		3.88	20.9		5.74
Duplicate of J1N1N0	J1N1N1	1/9/2012	0.302	J	0.210	3.56		0.173	12.0		3.38	18.5		5.07

Analysis:

TDL		1	1	10	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD				
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	4910		4.40	2.42		0.880	59.5		0.440	0.225		0.176
Duplicate of J1N1N0	J1N1N1	1/9/2012	4680		4.27	2.06		0.855	53.1		0.427	0.216		0.171

Analysis:

TDL		5	10	2	0.5
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	4.8%		11.4%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	0.931	B	1.76	0.0758	B	0.176	3870		88.0	7.14		0.176
Duplicate of J1N1N0	J1N1N1	1/9/2012	0.880	B	1.71	0.0621	B	0.171	3560		85.5	6.51		0.171

Analysis:

TDL		2	0.5	100	1
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)
	Both >5xTDL?			Yes (calc RPD)	Yes (calc RPD)
	RPD			8.3%	9.2%
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	Not applicable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Cobalt			Copper			Iron			Lead		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	4.96		1.76	9.62		0.880	16300		17.6	3.54		0.440
Duplicate of J1N1N0	J1N1N1	1/9/2012	4.62		1.71	8.74		0.855	14800		17.1	3.37		0.427

Analysis:

TDL		2	1	5	5
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD		9.6%	9.6%	
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Lithium			Magnesium			Manganese			Molybdenum		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	5.32		2.20	3130		66.0	232		4.40	0.450	B	1.76
Duplicate of J1N1N0	J1N1N1	1/9/2012	5.27		2.14	2940		64.1	227		4.27	0.257	B	1.71

Analysis:

TDL		2.5	75	5	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	
	RPD		6.3%	2.2%	
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Nickel			Potassium			Silicon			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	8.06		3.52	893		352	335		1.76	130		44.0
Duplicate of J1N1N0	J1N1N1	1/9/2012	7.98		3.42	904		342	319		1.71	119		42.7

Analysis:

TDL		4	400	2	50
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)
	RPD			4.9%	
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	No - acceptable

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Table 2. Relative Percent Difference Calculations for the 300-32 Waste Site. (3 pages)

Sampling Area	HEIS Number	Sample Date	Uranium mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL	TPH - Motor oil ug/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	15.3		0.121	43.3		2.20	36.7		8.80	4930	J	10000
Duplicate of J1N1N0	J1N1N1	1/9/2012	9.02		0.121	38.7		2.14	31.8		8.55	4370	J	10100

Analysis:

TDL		1	2.5	1	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	
	RPD	51.6%	11.2%	14.3%	
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	No - acceptable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Chloride mg/kg	Q	PQL	Nitrate mg/kg	Q	PQL	Nitrogen in Nitrite and Nitrate mg/kg	Q	PQL	Acenaphthene ug/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	2.0	B	4.7	8.5	J	4.7	2.23		0.47	8.11	J	3.39
Duplicate of J1N1N0	J1N1N1	1/9/2012	2.0	B	4.7	8.7	J	4.7	2.11		0.47	22.4	J	3.28

Analysis:

TDL		2	2.5	0.75	100
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD				
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Benzo(a)pyrene ug/kg	Q	PQL	Chrysene ug/kg	Q	PQL	Fluoranthene ug/kg	Q	PQL	Naphthalene ug/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	1.36	J	3.39	1.14	J	3.39	59.6		3.39	3.88	J	3.39
Duplicate of J1N1N0	J1N1N1	1/9/2012	1.33	J	3.28	0.903	J	3.28	3.71		3.28	3.17	J	3.28

Analysis:

TDL		15	100	50	100
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?			No-Stop (acceptable)	
	RPD				
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Phenanthrene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL	Aroclor-1248 ug/kg	Q	PQL	Aroclor-1254 ug/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	1.20	J	3.39	1.48	J	3.39	18.1		13.4	121		13.4
Duplicate of J1N1N0	J1N1N1	1/9/2012	1.15	J	3.28	1.25	J	3.28	36.5		13.4	146		13.4

Analysis:

TDL		50	50	16.5	16.5
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)
	Both >5xTDL?			No-Stop (acceptable)	Yes (calc RPD)
	RPD				18.7%
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	Not applicable

300-32 Waste Site Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Aroclor-1260 ug/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	25.7		13.4
Duplicate of J1N1N0	J1N1N1	1/9/2012	28.1		13.4

Analysis:

TDL		16.5
Duplicate Analysis	Both > PQL?	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)
	RPD	
	Difference > 2 TDL?	No - acceptable

CONCLUSION:

The calculations in Tables 1 and 2 demonstrate that the 300-32 waste site meets the requirements for the residential direct contact hazard quotients and carcinogenic (excess cancer) risk and RPDs, respectively, as identified in the RDR/RAWP (DOE-RL 2009). The hazard quotients and carcinogenic (excess cancer) risk and RPD calculations are for use in the RSVP for this waste site.

Attachment 1. 300-32 Waste Site Sampling Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Americium-241			Bismuth-214			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Location 10	J1N1N0	1/9/2012	0.054	U	0.054	0.466		0.075	0.034	U	0.034	0.038	U	0.038	0.101	U	0.101	0.136	U	0.136	0.094	U	0.094
Duplicate of J1N1N0	J1N1N1	1/9/2012	0.116	U	0.116	0.410		0.052	0.023	U	0.023	0.025	U	0.025	0.064	U	0.064	0.084	U	0.084	0.096	U	0.096
Location 1	J1N1M1	1/9/2012	0.157	U	0.157	0.408		0.054	0.021	U	0.021	0.025	U	0.025	0.064	U	0.064	0.085	U	0.085	0.089	U	0.089
Location 2	J1N1M2	1/9/2012	0.053	U	0.053	0.408		0.054	0.026	U	0.026	0.032	U	0.032	0.064	U	0.064	0.107	U	0.107	0.077	U	0.077
Location 3	J1N1M3	1/9/2012	0.287	U	0.287	0.370		0.076	0.041	U	0.041	0.047	U	0.047	0.098	U	0.098	0.184	U	0.184	0.124	U	0.124
Location 4	J1N1M4	1/9/2012	0.088	U	0.088	0.392		0.046	0.019	U	0.019	0.021	U	0.021	0.055	U	0.055	0.077	U	0.077	0.078	U	0.078
Location 5	J1N1M5	1/9/2012	0.107	U	0.107	0.406		0.059	0.030	U	0.030	0.032	U	0.032	0.072	U	0.072	0.104	U	0.104	0.079	U	0.079
Location 6	J1N1M6	1/9/2012	0.043	U	0.043	0.405		0.055	0.028	U	0.028	0.033	U	0.033	0.079	U	0.079	0.117	U	0.117	0.074	U	0.074
Location 7	J1N1M7	1/9/2012	0.053	U	0.053	0.440		0.046	0.028	U	0.028	0.028	U	0.028	0.073	U	0.073	0.089	U	0.089	0.083	U	0.083
Location 8	J1N1M8	1/9/2012	0.049	U	0.049	0.385		0.047	0.025	U	0.025	0.030	U	0.030	0.059	U	0.059	0.106	U	0.106	0.072	U	0.072
Location 9	J1N1M9	1/9/2012	0.167	U	0.167	0.428		0.048	0.023	U	0.023	0.025	U	0.025	0.064	U	0.064	0.089	U	0.089	0.094	U	0.094
Location 11	J1N1N4	1/10/2012	0.109	U	0.109	0.401		0.061	0.036	U	0.036	0.037	U	0.037	0.076	U	0.076	0.121	U	0.121	0.092	U	0.092
Location 12	J1N1N5	1/10/2012	0.111	U	0.111	0.411		0.049	0.020	U	0.020	0.023	U	0.023	0.058	U	0.058	0.068	U	0.068	0.084	U	0.084
Location 13	J1N1N6	1/10/2012	0.044	U	0.044	0.503		0.062	0.030	U	0.030	0.033	U	0.033	0.089	U	0.089	0.117	U	0.117	0.087	U	0.087
Location 14	J1N1N7	1/10/2012	0.125	U	0.125	0.358		0.126	0.050	U	0.050	0.066	U	0.066	0.135	U	0.135	0.191	U	0.191	0.138	U	0.138
Location 15	J1N1N8	1/10/2012	0.110	U	0.110	0.307		0.199	0.086	U	0.086	0.075	U	0.075	0.231	U	0.231	0.239	U	0.239	0.218	U	0.218

Acronyms and notes apply to all of the tables in this attachment.

Gray cells indicate not applicable.

* Due to RAG exceedance for TPH, Location 15 underwent additional remediation and was re-sampled.

Note: Data qualified with B, C, and/or J are considered acceptable values.

B = detected but below the reporting limit; result is an estimated concentration.

Comp = composite

D = result reported from a dilution

HEIS-Hanford Environmental Information System

J = estimated

MDA = minimum detected activity

PAH = polycyclic aromatic hydrocarbons

PCB = polychlorinated biphenyls

PQL = practical quantitation limit

R =rejected

Q = qualifier

QC = quality control.

SVOA = semivolatile organic analysis

TPH = total petroleum hydrocarbon

U = analyzed for and not detected.

VOA = volatile organic analysis

Attachment 1 Sheet No. 1 of 6

Originator N. K. Schiffern Date 12/18/12

Checked J. B. Berezovskiy Date 12/18/12

Calc. No. 0300X-CA-V0167 Rev. No. 0

Attachment 1. 300-32 Waste Site Sampling Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Lead-212			Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Uranium-233/234		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Location 10	J1N1N0	1/9/2012	0.979		0.057	19.8		0.366	0.453		0.073	0.853		0.167	0.946		0.055	0.853		0.167	5.60		0.164
Duplicate of J1N1N0	J1N1N1	1/9/2012	0.700		0.037	16.2		0.212	0.398		0.051	0.700		0.114	0.676		0.036	0.700		0.114	3.10		0.173
Location 1	J1N1M1	1/9/2012	0.640		0.034	15.7		0.270	0.396		0.052	0.624		0.107	0.618		0.033	0.624		0.107	3.70		0.177
Location 2	J1N1M2	1/9/2012	0.548		0.038	15.8		0.267	0.396		0.053	0.594		0.147	0.529		0.036	0.594		0.147	2.70		0.168
Location 3	J1N1M3	1/9/2012	0.532		0.047	15.7		0.338	0.359		0.073	0.620		0.159	0.514		0.045	0.620		0.159	1.01		0.175
Location 4	J1N1M4	1/9/2012	0.560		0.031	16.1		0.203	0.380		0.044	0.578		0.096	0.540		0.030	0.578		0.096	1.16		0.188
Location 5	J1N1M5	1/9/2012	0.540		0.040	15.5		0.253	0.394		0.057	0.541		0.147	0.521		0.039	0.541		0.147	1.41		0.177
Location 6	J1N1M6	1/9/2012	0.804		0.045	17.9		0.399	0.394		0.053	0.603		0.146	0.777		0.043	0.603		0.146	3.62		0.211
Location 7	J1N1M7	1/9/2012	0.639		0.043	16.2		0.258	0.427		0.044	0.635		0.121	0.617		0.041	0.635		0.121	3.85		0.200
Location 8	J1N1M8	1/9/2012	0.728		0.049	15.4		0.298	0.374		0.045	0.570		0.143	0.703		0.047	0.570		0.143	1.98		0.234
Location 9	J1N1M9	1/9/2012	0.644		0.039	16.0		0.250	0.416		0.047	0.742		0.094	0.622		0.037	0.742		0.094	3.36		0.231
Location 11	J1N1N4	1/10/2012	0.573		0.038	14.8		0.318	0.389		0.060	0.703		0.130	0.553		0.036	0.703		0.130	1.51		0.152
Location 12	J1N1N5	1/10/2012	0.618		0.036	16.0		0.194	0.399		0.047	0.632		0.076	0.598		0.035	0.632		0.076	6.05		0.166
Location 13	J1N1N6	1/10/2012	0.897		0.042	19.6		0.377	0.488		0.060	0.732		0.146	0.868		0.040	0.732		0.146	0.605		0.165
Location 14	J1N1N7	1/10/2012	0.525		0.070	12.5		0.590	0.347		0.122	0.506		0.172	0.508		0.068	0.506		0.172	7.32		0.154
Location 15	J1N1N8	1/10/2012	0.641		0.179	13.6		0.877	0.298		0.193	1.02		0.383	0.620		0.173	1.02		0.383	2.23		0.167

Sample Location	HEIS Number	Sample Date	Uranium-235			Uranium-235, AEA			Uranium-238			Uranium-238, AEA			Gross alpha			Gross beta		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Location 10	J1N1N0	1/9/2012	0.415	U	0.415	0.234	J	0.199	4.67	U	4.67	5.13		0.164	16.1		3.88	20.9		5.74
Duplicate of J1N1N0	J1N1N1	1/9/2012	0.254	U	0.254	0.302	J	0.210	6.98	U	6.98	3.56		0.173	12.0		3.38	18.5		5.07
Location 1	J1N1M1	1/9/2012	0.250	U	0.250	0.196	UJ	0.214	4.40	U	4.40	3.29		0.177	7.64		3.69	14.6		5.83
Location 2	J1N1M2	1/9/2012	0.274	U	0.274	0.293	J	0.204	3.89	U	3.89	2.86		0.168	7.54		2.60	21.2		6.13
Location 3	J1N1M3	1/9/2012	0.204	U	0.204	0.028	UJ	0.212	5.65	U	5.65	1.28		0.175	8.22		3.56	20.5		4.89
Location 4	J1N1M4	1/9/2012	0.150	U	0.150	0.030	UJ	0.228	2.86	U	2.86	0.64		0.188	13.3		3.73	17.2		5.11
Location 5	J1N1M5	1/9/2012	0.207	U	0.207	0.084	UJ	0.214	4.35	U	4.35	1.46		0.177	6.81		3.95	14.7		5.21
Location 6	J1N1M6	1/9/2012	0.203	U	0.203	0.134	UJ	0.204	3.71	U	3.71	3.51		0.169	11.0		3.22	23.7		5.28
Location 7	J1N1M7	1/9/2012	0.192	U	0.192	0.285	J	0.242	6.32	U	6.32	3.90		0.200	10.5		4.03	17.7		5.87
Location 8	J1N1M8	1/9/2012	0.187	U	0.187	0.037	UJ	0.283	7.00	U	7.00	1.98		0.234	10.9		2.86	18.9		6.18
Location 9	J1N1M9	1/9/2012	0.273	U	0.273	0.146	UJ	0.280	5.39	U	5.39	3.72		0.231	12.4		3.92	23.8		4.93
Location 11	J1N1N4	1/10/2012	0.180	U	0.180	0.048	UJ	0.184	4.40	U	4.40	1.57		0.152	9.75		3.96	15.1		5.21
Location 12	J1N1N5	1/10/2012	0.258	U	0.258	0.342	J	0.201	6.47	U	6.47	5.66		0.166	18.1		3.20	23.3		5.28
Location 13	J1N1N6	1/10/2012	0.183	U	0.183	0.026	UJ	0.200	3.85	U	3.85	0.627		0.165	11.3		3.54	183		6.30
Location 14	J1N1N7	1/10/2012	0.445	U	0.445	0.317	J	0.187	7.16	U	7.16	6.59		0.154	1.97		0.354	3.63		0.374
Location 15	J1N1N8	1/10/2012	0.448	U	0.448	0.159	UJ	0.202	10.5	U	10.5	2.25		0.167	8.81		3.63	15.2		5.82

Attachment 1
Originator N. K. Schiffern
Checked I. B. Berezovskiy
Calc. No. 0300X-CA-V0167

Sheet No. 2 of 16
Date 12/18/12
Date 12/18/12
Rev. No. 0

Attachment 1. 300-32 Waste Site Sampling Results (Metals).

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	4910		4.40	0.528	UJ	0.528	2.42		0.880	59.5		0.440	0.225		0.176	0.931	B	1.76	0.0758	B	0.176
Duplicate of J1N1N0	J1N1N1	1/9/2012	4680		4.27	0.513	UJ	0.513	2.06		0.855	53.1		0.427	0.216		0.171	0.880	B	1.71	0.0621	B	0.171
Location 1	J1N1M1	1/9/2012	4750		3.76	0.452	UJ	0.452	1.93		0.753	61.8		0.376	0.220		0.151	3.63		1.51	0.189		0.151
Location 2	J1N1M2	1/9/2012	5870		4.76	0.571	UJ	0.571	3.84		0.952	68.4		0.476	0.270		0.190	2.58		1.90	0.121	B	0.190
Location 3	J1N1M3	1/9/2012	4790		4.46	0.535	UJ	0.535	2.83		0.892	82.7		0.446	0.219		0.178	0.815	B	1.78	0.0722	B	0.178
Location 4	J1N1M4	1/9/2012	4520		3.71	0.445	UJ	0.445	2.93		0.742	51.3		0.371	0.202		0.148	0.655	B	1.48	0.0601	B	0.148
Location 5	J1N1M5	1/9/2012	4010		3.93	0.471	UJ	0.471	2.12		0.786	44.4		0.393	0.178		0.157	0.614	B	1.57	0.0528	B	0.157
Location 6	J1N1M6	1/9/2012	4810		4.71	0.566	UJ	0.566	2.75		0.943	50.4		0.471	0.216		0.189	1.25	B	1.89	0.0853	B	0.189
Location 7	J1N1M7	1/9/2012	5210		4.63	0.556	UJ	0.556	2.51		0.927	72.9		0.463	0.248		0.185	1.91		1.85	0.101	B	0.185
Location 8	J1N1M8	1/9/2012	4610		3.60	0.432	UJ	0.432	2.34		0.720	60.3		0.360	0.210		0.144	0.765	B	1.44	0.0635	B	0.144
Location 9	J1N1M9	1/9/2012	4870		3.93	0.472	UJ	0.472	2.78		0.786	61.8		0.393	0.233		0.157	1.24	B	1.57	0.105	B	0.157
Location 11	J1N1N4	1/10/2012	5850		5.08	0.610	UJ	0.610	2.60		1.02	64.7		0.508	0.259		0.203	2.28		2.03	0.107	B	0.203
Location 12	J1N1N5	1/10/2012	5280		4.32	0.519	UJ	0.519	2.43		0.865	63.5		0.432	0.232		0.173	3.04		1.73	0.169	B	0.173
Location 13	J1N1N6	1/10/2012	5620		4.63	0.555	UJ	0.555	2.29		0.925	63.7		0.463	0.254		0.185	0.859	B	1.85	0.0697	B	0.185
Location 14	J1N1N7	1/10/2012	5520		5.12	0.615	UJ	0.615	2.64		1.02	95.7		0.512	0.245		0.205	1.68	B	2.05	0.0989	B	0.205
Location 15	J1N1N8	1/10/2012	4890		4.45	0.534	UJ	0.534	2.30		0.890	77.3		0.445	0.236		0.178	4.87		1.78	0.168	B	0.178
Equipment Blank	J1N1N3	1/10/2012	193		4.72	0.566	UJ	0.566	0.944	U	0.944	1.99		0.472	0.189	U	0.189	1.89	U	1.89	0.189	U	0.189

Sample Location	HEIS Number	Sample Date	Calcium			Chromium			Cobalt			Copper			Hexavalent Chromium			Iron			Lead		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	3870		88.0	7.14		0.176	4.96		1.76	9.62		0.880	0.51	U	0.51	16300		17.6	3.54		0.440
Duplicate of J1N1N0	J1N1N1	1/9/2012	3560		85.5	6.51		0.171	4.62		1.71	8.74		0.855	0.51	U	0.51	14800		17.1	3.37		0.427
Location 1	J1N1M1	1/9/2012	4170		75.3	9.41		0.151	4.69		1.51	13.6		0.753	0.51	U	0.51	14900		15.1	7.46		0.376
Location 2	J1N1M2	1/9/2012	4870		95.2	8.33		0.190	4.97		1.90	12.1		0.952	0.51	U	0.51	17700		19.0	5.45		0.476
Location 3	J1N1M3	1/9/2012	5640		89.2	6.31		0.178	4.65		1.78	8.34		0.892	0.51	U	0.51	15600		17.8	3.03		0.446
Location 4	J1N1M4	1/9/2012	6150		74.2	5.73		0.148	4.02		1.48	7.16		0.742	0.51	U	0.51	14000		14.8	2.50		0.371
Location 5	J1N1M5	1/9/2012	6950		78.6	5.48		0.157	3.87		1.57	7.26		0.786	0.51	U	0.51	13000		15.7	2.50		0.393
Location 6	J1N1M6	1/9/2012	6350		94.3	6.85		0.189	4.62		1.89	9.26		0.943	0.51	U	0.51	15900		18.9	5.59		0.471
Location 7	J1N1M7	1/9/2012	5870		92.7	7.07		0.185	5.06		1.85	10.1		0.927	0.51	U	0.51	17200		18.5	4.23		0.463
Location 8	J1N1M8	1/9/2012	3870		72.0	5.38		0.144	4.45		1.44	11.2		0.720	0.51	U	0.51	15100		14.4	3.14		0.360
Location 9	J1N1M9	1/9/2012	4190		78.6	6.82		0.157	5.32		1.57	21.3		0.786	0.51	U	0.51	16900		15.7	4.23		0.393
Location 11	J1N1N4	1/10/2012	3680		102	7.24		0.203	5.54		2.03	10.9		1.02	0.52	U	0.52	18000		20.3	13.4		0.508
Location 12	J1N1N5	1/10/2012	6150		86.5	7.46		0.173	4.76		1.73	10.7		0.865	0.52	U	0.52	16100		17.3	4.68		0.432
Location 13	J1N1N6	1/10/2012	2740		92.5	6.47		0.185	4.98		1.85	8.90		0.925	0.53	U	0.53	16900		18.5	3.19		0.463
Location 14	J1N1N7	1/10/2012	9780		102	7.47		0.205	5.49		2.05	10.9		1.02	0.52	U	0.52	18100		20.5	3.86		0.512
Location 15	J1N1N8	1/10/2012	6560		89.0	6.98		0.178	5.53		1.78	11.6		0.890	0.53	U	0.53	15800		17.8	4.29		0.445
Equipment Blank	J1N1N3	1/10/2012	35.3	B	94.4	0.189	U	0.189	1.89	U	1.89	0.944	U	0.944				323		18.9	0.532		0.472

Attachment	1	Sheet No.	3 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1. 300-32 Waste Site Sampling Results (Metals).

Sample Location	HEIS Number	Sample Date	Lithium			Magnesium			Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	5.32		2.20	3130		66.0	232		4.40	0.0278	U	0.0278	0.450	B	1.76	8.06		3.52	893		352
Duplicate of J1N1N0	J1N1N1	1/9/2012	5.27		2.14	2940		64.1	227		4.27	0.0264	U	0.0264	0.257	B	1.71	7.98		3.42	904		342
Location 1	J1N1M1	1/9/2012	5.33		1.88	2910		56.4	228		3.76	0.0263	U	0.0263	0.300	B	1.51	7.02		3.01	981		301
Location 2	J1N1M2	1/9/2012	6.64		2.38	3670		71.4	261		4.76	0.0272	U	0.0272	0.736	B	1.90	8.71		3.81	1180		381
Location 3	J1N1M3	1/9/2012	5.82		2.23	3260		66.9	297		4.46	0.0262	U	0.0262	0.289	B	1.78	7.63		3.57	879		357
Location 4	J1N1M4	1/9/2012	5.44		1.85	3040		55.6	195		3.71	0.0271	U	0.0271	0.240	B	1.48	6.18		2.97	851		297
Location 5	J1N1M5	1/9/2012	5.08		1.96	2820		58.9	181		3.93	0.0270	U	0.0270	0.279	B	1.57	6.08		3.14	622		314
Location 6	J1N1M6	1/9/2012	5.88		2.36	3150		70.7	223		4.71	0.0241	U	0.0241	0.297	B	1.89	6.92		3.77	850		377
Location 7	J1N1M7	1/9/2012	6.07		2.32	3400		69.5	284		4.63	0.0270	U	0.0270	0.315	B	1.85	7.76		3.71	1010		371
Location 8	J1N1M8	1/9/2012	5.54		1.80	2930		54.0	218		3.60	0.0236	U	0.0236	0.255	B	1.44	6.60		2.88	885		288
Location 9	J1N1M9	1/9/2012	5.71		1.96	3170		58.9	273		3.93	0.0255	U	0.0255	0.313	B	1.57	7.23		3.14	929		314
Location 11	J1N1N4	1/10/2012	6.26		2.54	3290		76.2	281		5.08	0.0246	U	0.0246	0.322	B	2.03	7.59		4.07	1280		407
Location 12	J1N1N5	1/10/2012	6.26		2.16	3240		64.8	308		4.32	0.0267	U	0.0267	0.249	B	1.73	7.22		3.46	1090		346
Location 13	J1N1N6	1/10/2012	5.98		2.31	3130		69.4	254		4.63	0.0271	U	0.0271	0.272	B	1.85	7.07		3.70	1220		370
Location 14	J1N1N7	1/10/2012	6.23		2.56	3550		76.8	258		5.12	0.0247	U	0.0247	0.330	B	2.05	7.83		4.10	1110		410
Location 15	J1N1N8	1/10/2012	5.46		2.23	2900		66.8	237		4.45	0.0255	U	0.0255	0.345	B	1.78	7.57		3.56	1090		356
Equipment Blank	J1N1N3	1/10/2012	2.36	U	2.36	21.4	B	70.8	6.25		4.72	0.0237	U	0.0237	1.89	U	1.89	3.77	U	3.77	43.2	B	377

Sample Location	HEIS Number	Sample Date	Selenium			Silicon			Silver			Sodium			Uranium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	0.264	U	0.264	335		1.76	0.176	U	0.176	130		44.0	15.3		0.121	43.3		2.20	36.7		8.80
Duplicate of J1N1N0	J1N1N1	1/9/2012	0.256	U	0.256	319		1.71	0.171	U	0.171	119		42.7	9.02		0.121	38.7		2.14	31.8		8.55
Location 1	J1N1M1	1/9/2012	0.226	U	0.226	313		1.51	0.151	U	0.151	160		37.6	9.83		0.121	37.4		1.88	45.7		7.53
Location 2	J1N1M2	1/9/2012	0.285	U	0.285	487		1.90	0.190	U	0.190	175		47.6	7.02		0.121	43.5		2.38	42.4		9.52
Location 3	J1N1M3	1/9/2012	0.268	U	0.268	437		1.78	0.178	U	0.178	127		44.6	3.03		0.121	39.1		2.23	31.1		8.92
Location 4	J1N1M4	1/9/2012	0.222	U	0.222	337		1.48	0.148	U	0.148	121		37.1	2.40		0.121	35.5		1.85	28.9		7.42
Location 5	J1N1M5	1/9/2012	0.236	U	0.236	285		1.57	0.157	U	0.157	107		39.3	4.36		0.121	32.5		1.96	26.3		7.86
Location 6	J1N1M6	1/9/2012	0.283	U	0.283	462		1.89	0.189	U	0.189	145		47.1	10.3		0.121	40.7		2.36	35.0		9.43
Location 7	J1N1M7	1/9/2012	0.278	U	0.278	366		1.85	0.185	U	0.185	150		46.3	10.6		0.121	42.6		2.32	40.7		9.27
Location 8	J1N1M8	1/9/2012	0.216	U	0.216	261		1.44	0.144	U	0.144	111		36.0	5.89		0.121	37.5		1.80	35.0		7.20
Location 9	J1N1M9	1/9/2012	0.236	U	0.236	332		1.57	0.157	U	0.157	142		39.3	9.75		0.121	41.9		1.96	43.6		7.86
Location 11	J1N1N4	1/10/2012	0.305	U	0.305	642		2.03	0.203	U	0.203	139		50.8	4.55		0.121	43.6		2.54	43.3		10.2
Location 12	J1N1N5	1/10/2012	0.259	U	0.259	442		1.73	0.173	U	0.173	177		43.2	17.9		0.121	40.4		2.16	42.5		8.65
Location 13	J1N1N6	1/10/2012	0.278	U	0.278	410		1.85	0.185	U	0.185	114		46.3	1.54		0.121	41.4		2.31	32.8		9.25
Location 14	J1N1N7	1/10/2012	0.307	U	0.307	619		2.05	0.205	U	0.205	278		51.2	21.4		0.121	45.2		2.56	39.4		10.2
Location 15	J1N1N8	1/10/2012	0.267	U	0.267	336		1.78	0.178	U	0.178	162		44.5	6.23		0.121	40.5		2.23	41.2		8.90
Equipment Blank	J1N1N3	1/10/2012	0.283	U	0.283	182		1.89	0.189	U	0.189	47.2	U	47.2				0.407	B	2.36	1.37	B	9.44

Attachment	1	Sheet No.	4 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1
Originator N. K. Schiffern
Checked I. B. Berezovskiy
Calc. No. 0300X-CA-V0167

Sheet No. 5 of 16
Date 12/18/12
Date 12/18/12
Rev. No. 0

Attachment 1. 300-32 Waste Site Sampling Results (TPH and Physical).

Sample Location	IIEIS Number	Sample Date	TPH - Diesel			TPH - Motor oil			Percent moisture (wet sample)			Percent Solids		
			ug/kg	Q	PQL	ug/kg	Q	PQL	%	Q	PQL	%	Q	PQL
Location 10	J1N1N0	1/9/2012	3340	U	3340	4930	J	10000	2.05		0.10	97.9		0.1
Duplicate of J1N1N0	J1N1N1	1/9/2012	3350	U	3350	4370	J	10100	2.52		0.10	97.5		0.1
Location 1	J1N1M1	1/9/2012	13000	U	13000	106000	J	39100	2.29		0.10	97.7		0.1
Location 2	J1N1M2	1/9/2012	3320	U	3320	13200	J	9970	2.70		0.10	97.3		0.1
Location 3	J1N1M3	1/9/2012	3330	U	3330	5710	J	9990	1.70		0.10	98.3		0.1
Location 4	J1N1M4	1/9/2012	3250	U	3250	9740	UJ	9740	2.28		0.10	97.7		0.1
Location 5	J1N1M5	1/9/2012	3310	U	3310	9930	UJ	9930	2.08		0.10	97.9		0.1
Location 6	J1N1M6	1/9/2012	3310	U	3310	61500	J	9930	1.79		0.10	98.2		0.1
Location 7	J1N1M7	1/9/2012	3370	U	3370	23800	J	10100	1.90		0.10	98.1		0.1
Location 8	J1N1M8	1/9/2012	3360	U	3360	4740	J	10100	2.19		0.10	97.8		0.1
Location 9	J1N1M9	1/9/2012	3310	U	3310	51900	J	9930	2.12		0.10	97.9		0.1
Location 11	J1N1N4	1/10/2012	6670	U	6670	25300	J	20000	0.10		0.10	96.4		0.1
Location 12	J1N1N5	1/10/2012	3420	U	3420	34800	J	10200	3.56		0.10	96.4		0.1
Location 13	J1N1N6	1/10/2012	3480	U	3480	10500	UJ	10500	3.61		0.10	94.8		0.1
Location 14	J1N1N7	1/10/2012	3400	U	3400	6490	J	10200	5.21		0.10	95.7		0.1
Location 15*	J1N1N8	1/10/2012	27400	UJ	27400	1300000	UJ	82200	4.28		0.10	95.2		0.1
Resample of J1N1N8	J1R866	1/3/2013	1180	J	3610	10800	U	10800						
Comp-1	J1R867	1/3/2013	3450	U	3450	60600		10300						
Comp-2	J1R868	1/3/2013	3510	U	3510	9540	J	10500						
Trip Blank 1	J1N1M0	1/9/2012							0.10		0.10	100		0.1
Trip Blank 2	J1N1N2	1/10/2012							0.10		0.10	100		0.1
Equipment Blank	J1N1N3	1/10/2012										100		0.1

Attachment 1. 300-32 Waste Site Sampling Results (Anions).

Sample Location	HEIS Number	Sample Date	Bromide			Chloride			Fluoride			Nitrate			Nitrite			Nitrogen in Nitrite and Nitrate		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	4.7	U	4.7	2.0	B	4.7	4.7	U	4.7	8.5	J	4.7	4.7	UR	4.7	2.23		0.47
Duplicate of J1N1N0	J1N1N1	1/9/2012	4.7	U	4.7	2.0	B	4.7	4.7	U	4.7	8.7	J	4.7	4.7	UR	4.7	2.11		0.47
Location 1	J1N1M1	1/9/2012	5.1	U	5.1	3.1	B	5.1	5.1	U	5.1	72.1	J	5.1	5.1	UR	5.1	16.3	D	1.02
Location 2	J1N1M2	1/9/2012	5.0	U	5.0	4.2	B	5.0	1.1	B	5.0	29.6	J	5.0	5.0	UR	5.0	6.75		0.50
Location 3	J1N1M3	1/9/2012	5.1	U	5.1	3.6	B	5.1	5.1	U	5.1	10.3	J	5.1	5.1	UR	5.1	2.34		0.51
Location 4	J1N1M4	1/9/2012	4.6	U	4.6	1.5	B	4.6	4.6	U	4.6	2.7	BJ	4.6	4.6	UR	4.6	0.75		0.46
Location 5	J1N1M5	1/9/2012	5.0	U	5.0	1.1	B	5.0	5.0	U	5.0	2.1	BJ	5.0	5.0	UR	5.0	0.53		0.50
Location 6	J1N1M6	1/9/2012	5.1	U	5.1	1.5	B	5.1	5.1	U	5.1	4.5	BJ	5.1	5.1	UR	5.1	1.18		0.51
Location 7	J1N1M7	1/9/2012	4.6	U	4.6	5.5		4.6	4.6	U	4.6	16.0	J	4.6	4.6	UR	4.6	3.62		0.46
Location 8	J1N1M8	1/9/2012	4.8	U	4.8	1.3	B	4.8	4.8	U	4.8	3.3	BJ	4.8	4.8	UR	4.8	0.83		0.48
Location 9	J1N1M9	1/9/2012	4.6	U	4.6	10.9		4.6	4.6	U	4.6	11.1	J	4.6	4.6	UR	4.6	2.57		0.46
Location 11	J1N1N4	1/10/2012	5.1	U	5.1	1.3	B	5.1	5.1	U	5.1	6.7	J	5.1	5.1	UR	5.1	1.59		0.51
Location 12	J1N1N5	1/10/2012	5.1	U	5.1	4.3	B	5.1	5.1	U	5.1	21.1	J	5.1	1.5	BJ	5.1	5.06		0.51
Location 13	J1N1N6	1/10/2012	5.2	U	5.2	1.3	B	5.2	5.2	U	5.2	3.6	BJ	5.2	5.2	UR	5.2	0.80		0.52
Location 14	J1N1N7	1/10/2012	2.2	B	4.9	312	D	24.5	4.9	U	4.9	39.4	J	4.9	4.9	UR	4.9	8.18		0.49
Location 15	J1N1N8	1/10/2012	4.9	U	4.9	3.2	B	4.9	4.9	U	4.9	4.9	UR	4.9	4.9	UR	4.9	0.49	U	0.49

Sample Location	HEIS Number	Sample Date	Phosphate			Sulfate		
			mg/kg	Q	PQL	mg/kg	Q	PQL
Location 10	J1N1N0	1/9/2012	9.3	UR	9.3	9.8	U	4.7
Duplicate of J1N1N0	J1N1N1	1/9/2012	2.2	BJ	9.4	9.8	U	4.7
Location 1	J1N1M1	1/9/2012	2.4	BJ	10.2	47.0		5.1
Location 2	J1N1M2	1/9/2012	2.2	BJ	10.0	44.8		5.0
Location 3	J1N1M3	1/9/2012	10.1	UR	10.1	12.5	U	5.1
Location 4	J1N1M4	1/9/2012	9.2	UR	9.2	5.8	U	4.6
Location 5	J1N1M5	1/9/2012	9.9	UR	9.9	4.6	BU	5.0
Location 6	J1N1M6	1/9/2012	10.1	UR	10.1	14.1	U	5.1
Location 7	J1N1M7	1/9/2012	9.2	UR	9.2	62.0		4.6
Location 8	J1N1M8	1/9/2012	9.7	UR	9.7	14.4	U	4.8
Location 9	J1N1M9	1/9/2012	9.2	UR	9.2	135	D	9.2
Location 11	J1N1N4	1/10/2012	3.2	BJ	10.2	24.7		5.1
Location 12	J1N1N5	1/10/2012	2.2	BJ	10.3	105	D	10.3
Location 13	J1N1N6	1/10/2012	3.9	BJ	10.5	3.0	BU	5.2
Location 14	J1N1N7	1/10/2012	9.8	UR	9.8	246	D	24.5
Location 15	J1N1N8	1/10/2012	9.8	UR	9.8	41.6		4.9

Attachment	1	Sheet No.	6 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1. 300-32 Waste Site Sample Results. (Organics)

Constituents	Class	J1N1N0, Location 10			J1N1N1, Duplicate of J1N1N0			J1N1M1, Location 1			J1N1M2, Location 2		
		1/9/2012			1/9/2012			1/9/2012			1/9/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
1,2-Dichlorobenzene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
1,3-Dichlorobenzene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
1,4-Dichlorobenzene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2,4,5-Trichlorophenol	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2,4,6-Trichlorophenol	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2,4-Dichlorophenol	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2,4-Dimethylphenol	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2,4-Dinitrophenol	SVOA	1630	UJ	1630	1650	UJ	1650	20100	UDJ	20100	4810	UDJ	4810
2,4-Dinitrotoluene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2,6-Dinitrotoluene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2-Chloronaphthalene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2-Chlorophenol	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2-Methylnaphthalene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2-Methylphenol (cresol, o-)	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
2-Nitroaniline	SVOA	1630	U	1630	1650	U	1650	20100	UD	20100	4810	UD	4810
2-Nitrophenol	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
3+4 Methylphenol (cresol, m+p)	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
3,3'-Dichlorobenzidine	SVOA	652	UJ	652	658	UJ	658	8030	UDJ	8030	1930	UDJ	1930
3-Nitroaniline	SVOA	1630	U	1630	1650	U	1650	20100	UD	20100	4810	UD	4810
4,6-Dinitro-2-methylphenol	SVOA	326	UJ	326	329	UJ	329	4020	UDJ	4020	963	UDJ	963
4-Bromophenylphenyl ether	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
4-Chloro-3-methylphenol	SVOA	326	UJ	326	329	UJ	329	4020	UDJ	4020	963	UDJ	963
4-Chloroaniline	SVOA	326	UJ	326	329	UJ	329	4020	UDJ	4020	963	UDJ	963
4-Chlorophenylphenyl ether	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
4-Nitroaniline	SVOA	1630	U	1630	1650	U	1650	20100	UD	20100	4810	UD	4810
4-Nitrophenol	SVOA	1630	UJ	1630	1650	UJ	1650	20100	UDJ	20100	4810	UDJ	4810
Acenaphthene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Acenaphthylene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Anthracene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Benzo(a)anthracene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Benzo(a)pyrene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Benzo(b)fluoranthene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Benzo(ghi)perylene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Benzo(k)fluoranthene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Bis(2-chloro-1-methylethyl)ether	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Bis(2-Chloroethoxy)methane	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Bis(2-chloroethyl) ether	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Bis(2-ethylhexyl) phthalate	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Butylbenzylphthalate	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Carbazole	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Chrysene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Di-n-butylphthalate	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Di-n-octylphthalate	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Dibenz[a,h]anthracene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Dibenzofuran	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Diethyl phthalate	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Dimethyl phthalate	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Fluoranthene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Fluorene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Hexachlorobenzene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Hexachlorobutadiene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Hexachlorocyclopentadiene	SVOA	326	UJ	326	329	UJ	329	4020	UDJ	4020	963	UDJ	963
Hexachloroethane	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Indeno(1,2,3-cd)pyrene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Isophorone	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
N-Nitroso-di-n-dipropylamine	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
N-Nitrosodiphenylamine	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Naphthalene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Nitrobenzene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Pentachlorophenol	SVOA	1630	UJ	1630	1650	UJ	1650	20100	UDJ	20100	4810	UDJ	4810
Phenanthrene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Phenol	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963
Pyrene	SVOA	326	U	326	329	U	329	4020	UD	4020	963	UD	963

Attachment	1	Sheet No.	7 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1. 300-32 Waste Site Sample Results. (Organics)

Constituents	Class	J1N1N0, Location 10			J1N1N1, Duplicate of J1N1N0			J1N1M1, Location 1			J1N1M2, Location 2		
		1/9/2012			1/9/2012			1/9/2012			1/9/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	6.11	J	3.39	22.4	J	3.28	44.0	J	3.34	3.42	UJ	3.42
Acenaphthylene	PAH	3.39	UJ	3.39	3.28	UJ	3.28	3.34	UJ	3.34	3.42	UJ	3.42
Anthracene	PAH	3.39	UJ	3.39	3.28	UJ	3.28	3.34	UJ	3.34	3.42	UJ	3.42
Benzo(a)anthracene	PAH	3.39	U	3.39	3.14	J	3.28	3.34	U	3.34	1.34	J	3.42
Benzo(a)pyrene	PAH	1.36	J	3.39	1.33	J	3.28	3.34	U	3.34	1.66	J	3.42
Benzo(b)fluoranthene	PAH	1.29	J	3.39	3.28	U	3.28	3.34	U	3.34	3.42	U	3.42
Benzo(ghi)perylene	PAH	3.39	U	3.39	3.28	U	3.28	3.34	U	3.34	3.42	U	3.42
Benzo(k)fluoranthene	PAH	3.39	U	3.39	3.28	U	3.28	3.14	J	3.34	3.42	U	3.42
Chrysene	PAH	1.14	J	3.39	0.903	J	3.28	3.34	U	3.34	3.42	U	3.42
Dibenz[a,h]anthracene	PAH	3.39	U	3.39	3.28	U	3.28	3.34	U	3.34	3.42	U	3.42
Fluoranthene	PAH	59.6		3.39	3.71		3.28	7.07		3.34	3.42	U	3.42
Fluorene	PAH	3.39	UJ	3.39	3.28	UJ	3.28	1.14	J	3.34	3.42	UJ	3.42
Indeno(1,2,3-cd)pyrene	PAH	3.39	U	3.39	3.28	U	3.28	3.34	U	3.34	2.23	J	3.42
Naphthalene	PAH	3.68	J	3.39	3.17	J	3.28	3.34	UJ	3.34	3.36	J	3.42
Phenanthrene	PAH	1.20	J	3.39	1.15	J	3.28	1.86	J	3.34	3.42	U	3.42
Pyrene	PAH	1.48	J	3.39	1.25	J	3.28	1.87	J	3.34	3.42	U	3.42
Aroclor-1016	PCB	13.4	U	13.4	13.4	U	13.4	13.6	U	13.6	13.3	U	13.3
Aroclor-1221	PCB	13.4	U	13.4	13.4	U	13.4	13.6	U	13.6	13.3	U	13.3
Aroclor-1232	PCB	13.4	U	13.4	13.4	U	13.4	13.6	U	13.6	13.3	U	13.3
Aroclor-1242	PCB	13.4	U	13.4	13.4	U	13.4	13.6	U	13.6	13.3	U	13.3
Aroclor-1248	PCB	18.1		13.4	36.5		13.4	12.6	J	13.6	3.44	J	13.3
Aroclor-1254	PCB	121		13.4	146		13.4	102		13.6	21.8		13.3
Aroclor-1260	PCB	25.7		13.4	28.1		13.4	29.8		13.6	6.35	J	13.3
Aroclor-1262	PCB	13.4	U	13.4	13.4	U	13.4	13.6	U	13.6	13.3	U	13.3
Aroclor-1268	PCB	13.4	U	13.4	13.4	U	13.4	13.6	U	13.6	13.3	U	13.3
1,1,1-Trichloroethane	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
1,1,2,2-Tetrachloroethane	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
1,1,2-Trichloroethane	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
1,1-Dichloroethane	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
1,1-Dichloroethene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
1,2-Dichloroethane	VOA	5.96	U	5.96	6.06	U	6.06	5.63	U	5.63	4.73	U	4.73
1,2-Dichloroethene(Total)	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
1,2-Dichloropropane	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
2-Butanone	VOA	11.9	U	11.9	12.1	U	12.1	11.3	U	11.3	9.46	U	9.46
2-Hexanone	VOA	11.9	U	11.9	12.1	U	12.1	11.3	U	11.3	9.46	U	9.46
4-Methyl-2-Pentanone	VOA	11.9	U	11.9	12.1	U	12.1	11.3	U	11.3	9.46	U	9.46
Acetone	VOA	11.9	U	11.9	12.1	U	12.1	11.3	U	11.3	9.46	U	9.46
Benzene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Bromodichloromethane	VOA	5.96	U	5.96	6.06	U	6.06	5.63	U	5.63	4.73	U	4.73
Bromoform	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Bromomethane	VOA	9.93	U	9.93	10.1	U	10.1	9.39	U	9.39	7.88	U	7.88
Carbon disulfide	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Carbon tetrachloride	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Chlorobenzene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Chloroethane	VOA	9.93	U	9.93	10.1	U	10.1	9.39	U	9.39	7.88	U	7.88
Chloroform	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Chloromethane	VOA	9.93	U	9.93	10.1	U	10.1	9.39	U	9.39	7.88	U	7.88
cis-1,2-Dichloroethylene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
cis-1,3-Dichloropropene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Dibromochloromethane	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Ethylbenzene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Methylenechloride	VOA	5.96	U	5.96	6.06	U	6.06	5.63	U	5.63	4.73	U	4.73
Styrene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Tetrachloroethene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Toluene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
trans-1,2-Dichloroethylene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
trans-1,3-Dichloropropene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Trichloroethene	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94
Vinyl chloride	VOA	9.93	U	9.93	10.1	U	10.1	9.39	U	9.39	7.88	U	7.88
Xylenes (total)	VOA	4.97	U	4.97	5.05	U	5.05	4.69	U	4.69	3.94	U	3.94

Attachment 1 Sheet No. 8 of 16
Originator N. K. Schiffern Date 12/18/12
Checked I. B. Berezovskiy Date 12/18/12
Calc. No. 0300X-CA-V0167 Rev. No. 0

Attachment 1. 300-32 Waste Site Sample Results. (Organics)

Constituents	Class	J1N1M3, Location 3			J1N1M4, Location 4			J1N1M5, Location 5			J1N1M6, Location 6		
		1/9/2012			1/9/2012			1/9/2012			1/9/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
1,2-Dichlorobenzene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
1,3-Dichlorobenzene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
1,4-Dichlorobenzene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2,4,5-Trichlorophenol	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2,4,6-Trichlorophenol	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2,4-Dichlorophenol	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2,4-Dimethylphenol	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2,4-Dinitrophenol	SVOA	1610	UJ	1610	1630	UJ	1630	1650	UJ	1650	3300	UDJ	3300
2,4-Dinitrotoluene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2,6-Dinitrotoluene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2-Chloronaphthalene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2-Chlorophenol	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2-Methylnaphthalene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2-Methylphenol (cresol, o-)	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
2-Nitroaniline	SVOA	1610	U	1610	1630	U	1630	1650	U	1650	3300	UD	3300
2-Nitrophenol	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
3+4 Methylphenol (cresol, m+p)	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
3,3'-Dichlorobenzidine	SVOA	644	UJ	644	651	UJ	651	659	UJ	659	1320	UDJ	1320
3-Nitroaniline	SVOA	1610	U	1610	1630	U	1630	1650	U	1650	3300	UD	3300
4,6-Dinitro-2-methylphenol	SVOA	322	UJ	322	325	UJ	325	330	UJ	330	659	UDJ	659
4-Bromophenylphenyl ether	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
4-Chloro-3-methylphenol	SVOA	322	UJ	322	325	UJ	325	330	UJ	330	659	UDJ	659
4-Chloroaniline	SVOA	322	UJ	322	325	UJ	325	330	UJ	330	659	UDJ	659
4-Chlorophenylphenyl ether	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
4-Nitroaniline	SVOA	1610	U	1610	1630	U	1630	1650	U	1650	3300	UD	3300
4-Nitrophenol	SVOA	1610	UJ	1610	1630	UJ	1630	1650	UJ	1650	3300	UDJ	3300
Acenaphthene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Acenaphthylene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Anthracene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Benzo(a)anthracene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Benzo(a)pyrene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Benzo(b)fluoranthene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Benzo(ghi)perylene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Benzo(k)fluoranthene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Bis(2-chloro-1-methylethyl)ether	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Bis(2-Chloroethoxy)methane	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Bis(2-chloroethyl) ether	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Bis(2-ethylhexyl) phthalate	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Butylbenzylphthalate	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Carbazole	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Chrysene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Di-n-butylphthalate	SVOA	322	U	322	249	J	325	330	U	330	659	UD	659
Di-n-octylphthalate	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Dibenz[a,h]anthracene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Dibenzofuran	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Diethyl phthalate	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Dimethyl phthalate	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Fluoranthene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Fluorene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Hexachlorobenzene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Hexachlorobutadiene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Hexachlorocyclopentadiene	SVOA	322	UJ	322	325	UJ	325	330	UJ	330	659	UDJ	659
Hexachloroethane	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Indeno(1,2,3-cd)pyrene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Isophorone	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
N-Nitroso-di-n-dipropylamine	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
N-Nitrosodiphenylamine	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Naphthalene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Nitrobenzene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Pentachlorophenol	SVOA	1610	UJ	1610	1630	UJ	1630	1650	UJ	1650	3300	UDJ	3300
Phenanthrene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Phenol	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659
Pyrene	SVOA	322	U	322	325	U	325	330	U	330	659	UD	659

Attachment 1 Sheet No. 9 of 16
Originator N. K. Schiffern Date 12/18/12
Checked I. B. Berezovskiy Date 12/18/12
Calc. No. 0300X-CA-V0167 Rev. No. 0

Attachment 1. 300-32 Waste Site Sampling Results. (Organics)

Constituents	Class	J1N1M3, Location 3 1/9/2012			J1N1M4, Location 4 1/9/2012			J1N1M5, Location 5 1/9/2012			J1N1M6, Location 6 1/9/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	5.96	J	3.35	5.96	J	3.35	3.21	UJ	3.21	5.30	J	3.18
Acenaphthylene	PAH	3.35	UJ	3.35	3.35	UJ	3.35	3.21	UJ	3.21	3.18	UJ	3.18
Anthracene	PAH	3.35	UJ	3.35	3.35	UJ	3.35	3.21	UJ	3.21	3.18	UJ	3.18
Benzo(a)anthracene	PAH	0.906	J	3.35	3.35	U	3.35	3.21	U	3.21	25.8		3.18
Benzo(a)pyrene	PAH	0.956	J	3.35	3.35	U	3.35	3.21	U	3.21	1.02	J	3.18
Benzo(b)fluoranthene	PAH	3.35	U	3.35	3.35	U	3.35	3.21	U	3.21	3.18	U	3.18
Benzo(ghi)perylene	PAH	3.35	U	3.35	3.35	U	3.35	3.21	U	3.21	3.18	U	3.18
Benzo(k)fluoranthene	PAH	3.35	U	3.35	3.35	U	3.35	3.21	U	3.21	3.18	U	3.18
Chrysene	PAH	3.35	U	3.35	3.35	U	3.35	3.21	U	3.21	3.18	U	3.18
Dibenz[a,h]anthracene	PAH	3.35	U	3.35	3.35	U	3.35	3.21	U	3.21	3.18	U	3.18
Fluoranthene	PAH	3.35	U	3.35	0.938	J	3.35	3.21	U	3.21	3.91		3.18
Fluorene	PAH	3.35	UJ	3.35	3.35	UJ	3.35	2.89	J	3.21	3.18	UJ	3.18
Indeno(1,2,3-cd)pyrene	PAH	1.01	J	3.35	3.35	U	3.35	3.21	U	3.21	3.18	U	3.18
Naphthalene	PAH	3.76	J	3.35	2.90	J	3.35	3.10	J	3.21	1.48	J	3.18
Phenanthrene	PAH	3.35	U	3.35	3.35	U	3.35	3.21	U	3.21	3.18	U	3.18
Pyrene	PAH	3.35	U	3.35	0.954	J	3.35	3.21	U	3.21	3.18	U	3.18
Aroclor-1016	PCB	13.5	U	13.5	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4
Aroclor-1221	PCB	13.5	U	13.5	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4
Aroclor-1232	PCB	13.5	U	13.5	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4
Aroclor-1242	PCB	13.5	U	13.5	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4
Aroclor-1248	PCB	13.5	U	13.5	13.4	U	13.4	13.4	U	13.4	7.95	J	13.4
Aroclor-1254	PCB	4.59	J	13.5	13.4	U	13.4	13.4	U	13.4	26.9		13.4
Aroclor-1260	PCB	13.5	U	13.5	13.4	U	13.4	13.4	U	13.4	5.66	J	13.4
Aroclor-1262	PCB	13.5	U	13.5	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4
Aroclor-1268	PCB	13.5	U	13.5	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4
1,1,1-Trichloroethane	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
1,1,2,2-Tetrachloroethane	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
1,1,2-Trichloroethane	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
1,1-Dichloroethane	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
1,1-Dichloroethene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
1,2-Dichloroethane	VOA	5.96	U	5.96	6.06	U	6.06	6.11	U	6.11	5.95	U	5.95
1,2-Dichloroethene(Total)	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
1,2-Dichloropropane	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
2-Butanone	VOA	11.9	U	11.9	12.1	U	12.1	12.2	U	12.2	11.9	U	11.9
2-Hexanone	VOA	11.9	U	11.9	12.1	U	12.1	12.2	U	12.2	11.9	U	11.9
4-Methyl-2-Pentanone	VOA	11.9	U	11.9	12.1	U	12.1	12.2	U	12.2	11.9	U	11.9
Acetone	VOA	11.9	U	11.9	12.1	U	12.1	12.2	U	12.2	11.9	U	11.9
Benzene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Bromodichloromethane	VOA	5.96	U	5.96	6.06	U	6.06	6.11	U	6.11	5.95	U	5.95
Bromoform	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Bromomethane	VOA	9.93	U	9.93	10.1	U	10.1	10.2	U	10.2	9.92	U	9.92
Carbon disulfide	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Carbon tetrachloride	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Chlorobenzene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Chloroethane	VOA	9.93	U	9.93	10.1	U	10.1	10.2	U	10.2	9.92	U	9.92
Chloroform	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Chloromethane	VOA	9.93	U	9.93	10.1	U	10.1	10.2	U	10.2	9.92	U	9.92
cis-1,2-Dichloroethylene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
cis-1,3-Dichloropropene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Dibromochloromethane	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Ethylbenzene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Methylenechloride	VOA	5.96	U	5.96	6.06	U	6.06	6.11	U	6.11	5.95	U	5.95
Styrene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Tetrachloroethene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Toluene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
trans-1,2-Dichloroethylene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
trans-1,3-Dichloropropene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Trichloroethene	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96
Vinyl chloride	VOA	9.93	U	9.93	10.1	U	10.1	10.2	U	10.2	9.92	U	9.92
Xylenes (total)	VOA	4.97	U	4.97	5.05	U	5.05	5.10	U	5.10	4.96	U	4.96

Attachment	1	Sheet No.	10 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1. 300-32 Waste Site Sampling Results. (Organics)

Constituents	Class	J1N1M7, Location 7			J1N1M8, Location 8			J1N1M9, Location 9			J1N1N4, Location 11		
		1/9/2012			1/9/2012			1/9/2012			1/10/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
1,2-Dichlorobenzene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
1,3-Dichlorobenzene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
1,4-Dichlorobenzene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2,4,5-Trichlorophenol	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2,4,6-Trichlorophenol	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2,4-Dichlorophenol	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2,4-Dimethylphenol	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2,4-Dinitrophenol	SVOA	9890	UDJ	9890	4770	UDJ	4770	3230	UDJ	3230	10200	UDJ	10200
2,4-Dinitrotoluene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2,6-Dinitrotoluene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2-Chloronaphthalene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2-Chlorophenol	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2-Methylnaphthalene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2-Methylphenol (cresol, o-)	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
2-Nitroaniline	SVOA	9890	UD	9890	4770	UD	4770	3230	UD	3230	10200	UD	10200
2-Nitrophenol	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
3+4 Methylphenol (cresol, m+p)	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
3,3'-Dichlorobenzidine	SVOA	3950	UDJ	3950	1910	UDJ	1910	1290	UDJ	1290	4080	UDJ	4080
3-Nitroaniline	SVOA	9890	UD	9890	4770	UD	4770	3230	UD	3230	10200	UD	10200
4,6-Dinitro-2-methylphenol	SVOA	1980	UDJ	1980	953	UDJ	953	647	UDJ	647	2040	UDJ	2040
4-Bromophenylphenyl ether	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
4-Chloro-3-methylphenol	SVOA	1980	UDJ	1980	953	UDJ	953	647	UDJ	647	2040	UDJ	2040
4-Chloroaniline	SVOA	1980	UDJ	1980	953	UDJ	953	647	UDJ	647	2040	UDJ	2040
4-Chlorophenylphenyl ether	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
4-Nitroaniline	SVOA	9890	UD	9890	4770	UD	4770	3230	UD	3230	10200	UD	10200
4-Nitrophenol	SVOA	9890	UDJ	9890	4770	UDJ	4770	3230	UDJ	3230	10200	UDJ	10200
Acenaphthene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Acenaphthylene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Anthracene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Benzo(a)anthracene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Benzo(a)pyrene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Benzo(b)fluoranthene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Benzo(ghi)perylene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Benzo(k)fluoranthene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Bis(2-chloro-1-methylethyl)ether	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Bis(2-Chloroethoxy)methane	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Bis(2-chloroethyl) ether	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Bis(2-ethylhexyl) phthalate	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Butylbenzylphthalate	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Carbazole	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Chrysene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Di-n-butylphthalate	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Di-n-octylphthalate	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Dibenz[a,h]anthracene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Dibenzofuran	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Diethyl phthalate	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Dimethyl phthalate	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Fluoranthene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Fluorene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Hexachlorobenzene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Hexachlorobutadiene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Hexachlorocyclopentadiene	SVOA	1980	UDJ	1980	953	UDJ	953	647	UDJ	647	2040	UDJ	2040
Hexachloroethane	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Indeno(1,2,3-cd)pyrene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Isophorone	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
N-Nitroso-di-n-dipropylamine	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
N-Nitrosodiphenylamine	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Naphthalene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Nitrobenzene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Pentachlorophenol	SVOA	9890	UDJ	9890	4770	UDJ	4770	3230	UDJ	3230	10200	UDJ	10200
Phenanthrene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Phenol	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040
Pyrene	SVOA	1980	UD	1980	953	UD	953	647	UD	647	2040	UD	2040

Attachment 1 Sheet No. 11 of 16
Originator N. K. Schiffern Date 12/18/12
Checked I. B. Berezovskiy Date 12/18/12
Calc. No. 0300X-CA-V0167 Rev. No. 0

Attachment 1. 300-32 Waste Site Sampling Results. (Organics)

Constituents	Class	J1N1M7, Location 7 1/9/2012			J1N1M8, Location 8 1/9/2012			J1N1M9, Location 9 1/9/2012			J1N1N4, Location 11 1/10/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	92.7	J	3.27	5.38	J	3.36	40.8	J	3.27	55.5	J	3.44
Acenaphthylene	PAH	3.27	UJ	3.27	3.36	UJ	3.36	3.27	UJ	3.27	3.44	UJ	3.44
Anthracene	PAH	3.27	UJ	3.27	3.36	UJ	3.36	3.27	UJ	3.27	3.44	UJ	3.44
Benzo(a)anthracene	PAH	8.41		3.27	3.36	U	3.36	2.29	J	3.27	2.81	J	3.44
Benzo(a)pyrene	PAH	10.7		3.27	1.23	J	3.36	5.73		3.27	9.09		3.44
Benzo(b)fluoranthene	PAH	13.0		3.27	3.36	U	3.36	4.26		3.27	3.44	U	3.44
Benzo(ghi)perylene	PAH	5.40		3.27	3.36	U	3.36	3.27	U	3.27	3.44	U	3.44
Benzo(k)fluoranthene	PAH	3.27		3.27	3.36	U	3.36	18.6		3.27	3.44	U	3.44
Chrysene	PAH	14.9		3.27	3.36	U	3.36	85.0		3.27	3.44	U	3.44
Dibenz[a,h]anthracene	PAH	3.27	U	3.27	3.36	U	3.36	3.27	U	3.27	3.44	U	3.44
Fluoranthene	PAH	9.17		3.27	2.29	J	3.36	8.35		3.27	7.63		3.44
Fluorene	PAH	3.27	UJ	3.27	3.36	UJ	3.36	3.27	UJ	3.27	2.53	J	3.44
Indeno(1,2,3-cd)pyrene	PAH	4.06		3.27	1.06	J	3.36	2.90	J	3.27	3.44	U	3.44
Naphthalene	PAH	8.07	J	3.27	2.19	J	3.36	108	J	3.27	4.08	J	3.44
Phenanthrene	PAH	2.14	J	3.27	0.875	J	3.36	3.05	J	3.27	2.03	J	3.44
Pyrene	PAH	9.03		3.27	1.18	J	3.36	4.75		3.27	3.44	U	3.44
Aroclor-1016	PCB	13.3	UJ	13.3	13.3	U	13.3	52.5	UD	52.5	13.5	UJ	13.5
Aroclor-1221	PCB	13.3	UJ	13.3	13.3	U	13.3	52.5	UD	52.5	13.5	UJ	13.5
Aroclor-1232	PCB	13.3	UJ	13.3	13.3	U	13.3	52.5	UD	52.5	13.5	UJ	13.5
Aroclor-1242	PCB	13.3	UJ	13.3	13.3	U	13.3	52.5	UD	52.5	13.5	UJ	13.5
Aroclor-1248	PCB	13.3	UJ	13.3	13.3	U	13.3	52.5	UD	52.5	13.5	UJ	13.5
Aroclor-1254	PCB	50.9	J	13.3	12.5	J	13.3	318	D	52.5	40.3	J	13.5
Aroclor-1260	PCB	21.4	J	13.3	13.3	U	13.3	96.2	D	52.5	17.2	J	13.5
Aroclor-1262	PCB	13.3	UJ	13.3	13.3	U	13.3	52.5	UD	52.5	13.5	UJ	13.5
Aroclor-1268	PCB	13.3	UJ	13.3	13.3	U	13.3	52.5	UD	52.5	13.5	UJ	13.5
1,1,1-Trichloroethane	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
1,1,2,2-Tetrachloroethane	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
1,1,2-Trichloroethane	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
1,1-Dichloroethane	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
1,1-Dichloroethene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
1,2-Dichloroethane	VOA	5.23	U	5.23	6.25	U	6.25	5.65	U	5.65	6.36	U	6.36
1,2-Dichloroethene(Total)	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
1,2-Dichloropropane	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
2-Butanone	VOA	10.5	U	10.5	12.5	U	12.5	11.3	U	11.3	12.7	U	12.7
2-Hexanone	VOA	10.5	U	10.5	12.5	U	12.5	11.3	U	11.3	12.7	U	12.7
4-Methyl-2-Pentanone	VOA	10.5	U	10.5	12.5	U	12.5	11.3	U	11.3	12.7	U	12.7
Acetone	VOA	10.5	U	10.5	12.5	U	12.5	11.3	U	11.3	12.7	U	12.7
Benzene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Bromodichloromethane	VOA	5.23	U	5.23	6.25	U	6.25	5.65	U	5.65	6.36	U	6.36
Bromoform	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Bromomethane	VOA	8.71	U	8.71	10.4	U	10.4	9.42	U	9.42	10.6	U	10.6
Carbon disulfide	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Carbon tetrachloride	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Chlorobenzene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Chloroethane	VOA	8.71	U	8.71	10.4	U	10.4	9.42	U	9.42	10.6	U	10.6
Chloroform	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Chloromethane	VOA	8.71	U	8.71	10.4	U	10.4	9.42	U	9.42	10.6	U	10.6
cis-1,2-Dichloroethylene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
cis-1,3-Dichloropropene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Dibromochloromethane	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Ethylbenzene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Methylenechloride	VOA	5.23	U	5.23	6.25	U	6.25	5.65	U	5.65	6.36	U	6.36
Styrene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Tetrachloroethene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Toluene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
trans-1,2-Dichloroethylene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
trans-1,3-Dichloropropene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Trichloroethene	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30
Vinyl chloride	VOA	8.71	U	8.71	10.4	U	10.4	9.42	U	9.42	10.6	U	10.6
Xylenes (total)	VOA	4.36	U	4.36	5.21	U	5.21	4.71	U	4.71	5.30	U	5.30

Attachment	1	Sheet No.	12 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1. 300-32 Waste Site Sampling Results. (Organics)

Constituents	Class	J1N1N5, Location 12 1/10/2012			J1N1N6, Location 13 1/10/2012			J1N1N7, Location 14 1/10/2012			J1N1N8, Location 15 1/10/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
1,2-Dichlorobenzene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
1,3-Dichlorobenzene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
1,4-Dichlorobenzene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
2,4,5-Trichlorophenol	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UDJ	2010
2,4,6-Trichlorophenol	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UDJ	2010
2,4-Dichlorophenol	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UDJ	2010
2,4-Dimethylphenol	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
2,4-Dinitrophenol	SVOA	5090	UDJ	5090	1740	UJ	1740	1700	UJ	1700	10000	UDJ	10000
2,4-Dinitrotoluene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
2,6-Dinitrotoluene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
2-Chloronaphthalene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
2-Chlorophenol	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
2-Methylnaphthalene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
2-Methylphenol (cresol, o-)	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
2-Nitroaniline	SVOA	5090	UD	5090	1740	U	1740	1700	U	1700	10000	UD	10000
2-Nitrophenol	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
3+4 Methylphenol (cresol, m+p)	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
3,3'-Dichlorobenzidine	SVOA	2040	UDJ	2040	695	UJ	695	678	UJ	678	4020	UDJ	4020
3-Nitroaniline	SVOA	5090	UD	5090	1740	U	1740	1700	U	1700	10000	UD	10000
4,6-Dinitro-2-methylphenol	SVOA	1020	UDJ	1020	347	UJ	347	339	UJ	339	2010	UDJ	2010
4-Bromophenylphenyl ether	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UDJ	2010
4-Chloro-3-methylphenol	SVOA	1020	UDJ	1020	347	UJ	347	339	UJ	339	2010	UDJ	2010
4-Chloroaniline	SVOA	1020	UDJ	1020	347	UJ	347	339	UJ	339	2010	UDJ	2010
4-Chlorophenylphenyl ether	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UDJ	2010
4-Nitroaniline	SVOA	5090	UD	5090	1740	U	1740	1700	U	1700	10000	UD	10000
4-Nitrophenol	SVOA	5090	UDJ	5090	1740	UJ	1740	1700	UJ	1700	10000	UDJ	10000
Acenaphthene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Acenaphthylene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Anthracene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Benzo(a)anthracene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Benzo(a)pyrene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Benzo(b)fluoranthene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Benzo(ghi)perylene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Benzo(k)fluoranthene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Bis(2-chloro-1-methylethyl)ether	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UDJ	2010
Bis(2-Chloroethoxy)methane	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UDJ	2010
Bis(2-chloroethyl) ether	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UDJ	2010
Bis(2-ethylhexyl) phthalate	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Butylbenzylphthalate	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Carbazole	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Chrysene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Di-n-butylphthalate	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Di-n-octylphthalate	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Dibenz[a,h]anthracene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Dibenzofuran	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Diethyl phthalate	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Dimethyl phthalate	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Fluoranthene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Fluorene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Hexachlorobenzene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Hexachlorobutadiene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Hexachlorocyclopentadiene	SVOA	1020	UDJ	1020	347	UJ	347	339	UJ	339	2010	UDJ	2010
Hexachloroethane	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Indeno(1,2,3-cd)pyrene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Isophorone	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
N-Nitroso-di-n-dipropylamine	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
N-Nitrosodiphenylamine	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Naphthalene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Nitrobenzene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Pentachlorophenol	SVOA	5090	UDJ	5090	1740	UJ	1740	1700	UJ	1700	10000	UDJ	10000
Phenanthrene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Phenol	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010
Pyrene	SVOA	1020	UD	1020	347	U	347	339	U	339	2010	UD	2010

Attachment	1	Sheet No.	13 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1. 316-3 Waste Site Sampling Results. (Organics)

Constituents	Class	J1N1N5, Location 12 1/10/2012			J1N1N6, Location 13 1/10/2012			J1N1N7, Location 14 1/10/2012			J1N1N8, Location 15 1/10/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	74.3	J	3.30	3.46	UJ	3.46	10.9	J	3.39	97.7	J	3.33
Acenaphthylene	PAH	7.19	J	3.30	3.46	UJ	3.46	4.51	J	3.39	3.33	UJ	3.33
Anthracene	PAH	3.30	UJ	3.30	3.46	UJ	3.46	3.39	UJ	3.39	3.33	UJ	3.33
Benzo(a)anthracene	PAH	4.76		3.30	3.46	U	3.46	45.6	J	3.39	7.56		3.33
Benzo(a)pyrene	PAH	8.28		3.30	3.46	U	3.46	1.87	J	3.39	12.2		3.33
Benzo(b)fluoranthene	PAH	3.30	U	3.30	3.46	U	3.46	3.39	UJ	3.39	3.33	U	3.33
Benzo(ghi)perylene	PAH	3.30	U	3.30	3.46	U	3.46	3.39	UJ	3.39	3.33	U	3.33
Benzo(k)fluoranthene	PAH	1.97	J	3.30	3.46	U	3.46	3.39	UJ	3.39	3.33	U	3.33
Chrysene	PAH	3.30	U	3.30	3.46	U	3.46	1.10	J	3.39	3.33	U	3.33
Dibenz[a,h]anthracene	PAH	3.30	U	3.30	3.46	U	3.46	3.39	UJ	3.39	3.33	U	3.33
Fluoranthene	PAH	14.9		3.30	3.46	U	3.46	2.29	J	3.39	218		3.33
Fluorene	PAH	1.07	J	3.30	3.46	UJ	3.46	3.39	UJ	3.39	41.5	J	3.33
Indeno(1,2,3-cd)pyrene	PAH	3.62		3.30	9.08		3.46	0.882	J	3.39	3.33	U	3.33
Naphthalene	PAH	3.72	J	3.30	2.04	J	3.46	4.43	J	3.39	2.55	J	3.33
Phenanthrene	PAH	7.19		3.30	3.46	U	3.46	3.39	UJ	3.39	2.56	J	3.33
Pyrene	PAH	5.52		3.30	3.46	U	3.46	0.984	J	3.39	3.33	U	3.33
Aroclor-1016	PCB	13.5	U	13.5	13.7	U	13.7	13.8	U	13.8	14.0	U	14.0
Aroclor-1221	PCB	13.5	U	13.5	13.7	U	13.7	13.8	U	13.8	14.0	U	14.0
Aroclor-1232	PCB	13.5	U	13.5	13.7	U	13.7	13.8	U	13.8	14.0	U	14.0
Aroclor-1242	PCB	13.5	U	13.5	13.7	U	13.7	13.8	U	13.8	14.0	U	14.0
Aroclor-1248	PCB	12.5	J	13.5	9.16	J	13.7	13.8	U	13.8	15.5		14.0
Aroclor-1254	PCB	106		13.5	21.9		13.7	181		13.8	82.4		14.0
Aroclor-1260	PCB	28.2		13.5	3.58	J	13.7	36.8		13.8	20.5		14.0
Aroclor-1262	PCB	13.5	U	13.5	13.7	U	13.7	13.8	U	13.8	14.0	U	14.0
Aroclor-1268	PCB	13.5	U	13.5	13.7	U	13.7	13.8	U	13.8	14.0	U	14.0
1,1,1-Trichloroethane	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
1,1,2,2-Tetrachloroethane	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
1,1,2-Trichloroethane	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
1,1-Dichloroethane	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
1,1-Dichloroethene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
1,2-Dichloroethane	VOA	6.50	U	6.50	6.53	U	6.53	6.53	U	6.53	6.87	U	6.87
1,2-Dichloroethene(Total)	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
1,2-Dichloropropane	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
2-Butanone	VOA	13.0	U	13.0	13.1	U	13.1	13.1	U	13.1	13.7	U	13.7
2-Hexanone	VOA	13.0	U	13.0	13.1	U	13.1	13.1	U	13.1	13.7	U	13.7
4-Methyl-2-Pentanone	VOA	13.0	U	13.0	13.1	U	13.1	13.1	U	13.1	13.7	U	13.7
Acetone	VOA	13.0	U	13.0	13.1	U	13.1	13.1	U	13.1	13.7	U	13.7
Benzene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Bromodichloromethane	VOA	6.50	U	6.50	6.53	U	6.53	6.53	U	6.53	6.87	U	6.87
Bromoform	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Bromomethane	VOA	10.8	U	10.8	10.9	U	10.9	10.9	U	10.9	11.4	U	11.4
Carbon disulfide	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Carbon tetrachloride	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Chlorobenzene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Chloroethane	VOA	10.8	U	10.8	10.9	U	10.9	10.9	U	10.9	11.4	U	11.4
Chloroform	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Chloromethane	VOA	10.8	U	10.8	10.9	U	10.9	10.9	U	10.9	11.4	U	11.4
cis-1,2-Dichloroethylene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
cis-1,3-Dichloropropene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Dibromochloromethane	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Ethylbenzene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Methylenechloride	VOA	6.50	U	6.5	6.53	U	6.53	6.53	U	6.53	6.87	U	6.87
Styrene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Tetrachloroethene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Toluene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
trans-1,2-Dichloroethylene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
trans-1,3-Dichloropropene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Trichloroethene	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72
Vinyl chloride	VOA	10.8	U	10.8	10.9	U	10.9	10.9	U	10.9	11.4	U	11.4
Xylenes (total)	VOA	5.41	U	5.41	5.44	U	5.44	5.44	U	5.44	5.72	U	5.72

Attachment	1	Sheet No.	14 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1. 300-32 Waste Site Sampling Results. (Organics)

Constituents	Class	J1N1N3, Equipment Blank 1/10/2012		
		ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	329	U	329
1,2-Dichlorobenzene	SVOA	329	U	329
1,3-Dichlorobenzene	SVOA	329	U	329
1,4-Dichlorobenzene	SVOA	329	U	329
2,4,5-Trichlorophenol	SVOA	329	U	329
2,4,6-Trichlorophenol	SVOA	329	U	329
2,4-Dichlorophenol	SVOA	329	U	329
2,4-Dimethylphenol	SVOA	329	U	329
2,4-Dinitrophenol	SVOA	1640	UJ	1640
2,4-Dinitrotoluene	SVOA	329	U	329
2,6-Dinitrotoluene	SVOA	329	U	329
2-Chloronaphthalene	SVOA	329	U	329
2-Chlorophenol	SVOA	329	U	329
2-Methylnaphthalene	SVOA	329	U	329
2-Methylphenol (cresol, o-)	SVOA	329	U	329
2-Nitroaniline	SVOA	1640	U	1640
2-Nitrophenol	SVOA	329	U	329
3+4 Methylphenol (cresol, m+p)	SVOA	329	U	329
3,3'-Dichlorobenzidine	SVOA	657	UJ	657
3-Nitroaniline	SVOA	1640	U	1640
4,6-Dinitro-2-methylphenol	SVOA	329	UJ	329
4-Bromophenylphenyl ether	SVOA	329	U	329
4-Chloro-3-methylphenol	SVOA	329	UJ	329
4-Chloroaniline	SVOA	329	UJ	329
4-Chlorophenylphenyl ether	SVOA	329	U	329
4-Nitroaniline	SVOA	1640	U	1640
4-Nitrophenol	SVOA	1640	UJ	1640
Acenaphthene	SVOA	329	U	329
Acenaphthylene	SVOA	329	U	329
Anthracene	SVOA	329	U	329
Benzo(a)anthracene	SVOA	329	U	329
Benzo(a)pyrene	SVOA	329	U	329
Benzo(b)fluoranthene	SVOA	329	U	329
Benzo(ghi)perylene	SVOA	329	U	329
Benzo(k)fluoranthene	SVOA	329	U	329
Bis(2-chloro-1-methylethyl)ether	SVOA	329	U	329
Bis(2-Chloroethoxy)methane	SVOA	329	U	329
Bis(2-chloroethyl) ether	SVOA	329	U	329
Bis(2-ethylhexyl) phthalate	SVOA	329	U	329
Butylbenzylphthalate	SVOA	329	U	329
Carbazole	SVOA	329	U	329
Chrysene	SVOA	329	U	329
Di-n-butylphthalate	SVOA	329	U	329
Di-n-octylphthalate	SVOA	329	U	329
Dibenz[a,h]anthracene	SVOA	329	U	329
Dibenzofuran	SVOA	329	U	329
Diethyl phthalate	SVOA	329	U	329
Dimethyl phthalate	SVOA	329	U	329
Fluoranthene	SVOA	329	U	329
Fluorene	SVOA	329	U	329
Hexachlorobenzene	SVOA	329	U	329
Hexachlorobutadiene	SVOA	329	U	329
Hexachlorocyclopentadiene	SVOA	329	UJ	329
Hexachloroethane	SVOA	329	U	329
Indeno(1,2,3-cd)pyrene	SVOA	329	U	329
Isophorone	SVOA	329	U	329
N-Nitroso-dl-n-dipropylamine	SVOA	329	U	329
N-Nitrosodiphenylamine	SVOA	329	U	329
Naphthalene	SVOA	329	U	329
Nitrobenzene	SVOA	329	U	329
Pentachlorophenol	SVOA	1640	UJ	1640
Phenanthrene	SVOA	329	U	329
Phenol	SVOA	329	U	329
Pyrene	SVOA	329	U	329

Attachment	1	Sheet No.	15 of 16
Originator	N. K. Schiffern	Date	12/18/12
Checked	I. B. Berezovskiy	Date	12/18/12
Calc. No.	0300X-CA-V0167	Rev. No.	0

Attachment 1. 300-32 Waste Site Investigation Sampling Results. (Organics)

Constituents	Class	J1N1M0, Trip Blank 1 1/9/2012			J1N1N2, Trip Blank 2 1/10/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH						
Acenaphthylene	PAH						
Anthracene	PAH						
Benzo(a)anthracene	PAH						
Benzo(a)pyrene	PAH						
Benzo(b)fluoranthene	PAH						
Benzo(ghi)perylene	PAH						
Benzo(k)fluoranthene	PAH						
Chrysene	PAH						
Dibenz[a,h]anthracene	PAH						
Fluoranthene	PAH						
Fluorene	PAH						
Indeno(1,2,3-cd)pyrene	PAH						
Naphthalene	PAH						
Phenanthrene	PAH						
Pyrene	PAH						
Aroclor-1016	PCB						
Aroclor-1221	PCB						
Aroclor-1232	PCB						
Aroclor-1242	PCB						
Aroclor-1248	PCB						
Aroclor-1254	PCB						
Aroclor-1260	PCB						
Aroclor-1262	PCB						
Aroclor-1268	PCB						
1,1,1-Trichloroethane	VOA	5.37	U	5.37	5.37	U	5.37
1,1,2,2-Tetrachloroethane	VOA	5.37	U	5.37	5.37	U	5.37
1,1,2-Trichloroethane	VOA	5.37	U	5.37	5.37	U	5.37
1,1-Dichloroethane	VOA	5.37	U	5.37	5.37	U	5.37
1,1-Dichloroethene	VOA	5.37	U	5.37	5.37	U	5.37
1,2-Dichloroethane	VOA	6.44	U	6.44	6.44	U	6.44
1,2-Dichloroethene(Total)	VOA	5.37	U	5.37	5.37	U	5.37
1,2-Dichloropropane	VOA	5.37	U	5.37	5.37	U	5.37
2-Butanone	VOA	12.9	U	12.9	12.9	U	12.9
2-Hexanone	VOA	5.14	J	12.9	12.9	U	12.9
4-Methyl-2-Pentanone	VOA	12.9	U	12.9	12.9	U	12.9
Acetone	VOA	42.2		12.9	38.3		12.9
Benzene	VOA	5.37	U	5.37	5.37	U	5.37
Bromodichloromethane	VOA	6.44	U	6.44	6.44	U	6.44
Bromoform	VOA	5.37	U	5.37	5.37	U	5.37
Bromomethane	VOA	10.7	U	10.7	10.7	U	10.7
Carbon disulfide	VOA	5.37	U	5.37	5.37	U	5.37
Carbon tetrachloride	VOA	5.37	U	5.37	5.37	U	5.37
Chlorobenzene	VOA	5.37	U	5.37	5.37	U	5.37
Chloroethane	VOA	10.7	U	10.7	10.7	U	10.7
Chloroform	VOA	5.37	U	5.37	5.37	U	5.37
Chloromethane	VOA	10.7	U	10.7	10.7	U	10.7
cis-1,2-Dichloroethylene	VOA	5.37	U	5.37	5.37	U	5.37
cis-1,3-Dichloropropene	VOA	5.37	U	5.37	5.37	U	5.37
Dibromochloromethane	VOA	5.37	U	5.37	5.37	U	5.37
Ethylbenzene	VOA	5.37	U	5.37	5.37	U	5.37
Methylenechloride	VOA	6.44	U	6.44	6.44	U	6.44
Styrene	VOA	5.37	U	5.37	5.37	U	5.37
Tetrachloroethene	VOA	5.37	U	5.37	5.37	U	5.37
Toluene	VOA	5.37	U	5.37	5.37	U	5.37
trans-1,2-Dichloroethylene	VOA	5.37	U	5.37	5.37	U	5.37
trans-1,3-Dichloropropene	VOA	5.37	U	5.37	5.37	U	5.37
Trichloroethene	VOA	5.37	U	5.37	5.37	U	5.37
Vinyl chloride	VOA	10.7	U	10.7	10.7	U	10.7
Xylenes (total)	VOA	5.37	U	5.37	5.37	U	5.37

Attachment 1
Originator N. K. Schiffern
Checked I. B. Berezovskiy
Calc. No. 0300X-CA-V0167

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Rev. No. 0

APPENDIX C

DATA QUALITY ASSESSMENT

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DATA QUALITY ASSESSMENT

CONFIRMATORY AND VERIFICATION SAMPLING

A data quality assessment (DQA) was performed to compare the confirmatory sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample design (WCH 2008). Confirmatory sampling showed the 300-32 waste site to be nearly clean. Additional remediation was needed after which three additional (verification) samples were collected per an agreement with the U.S. Environmental Protection Agency (EPA) (WCH 2013). This DQA was performed in accordance with site specific data quality objectives found in the *300 Area Remedial Action Sampling and Analysis Plan* (SAP) (DOE-RL 2011).

A review of the sample designs (WCH 2008, 2013), the field logbook (WCH 2013), and applicable analytical data packages has been performed as part of this DQA. All samples were collected and analyzed per the sample designs. To ensure quality data, the SAP data assurance requirements and the data validation procedures for chemical analysis (BHI 2000) are used as appropriate. This review involves evaluation of the data to determine if they are of the right type, quality, and quantity to support the intended use (i.e., closeout decisions). The DQA completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2006).

Confirmatory sample data collected at the 300-32 waste site were provided by the laboratories in two sample delivery groups (SDG) K3796 and KP0175. SDG K3796 was submitted for third-party validation. Major deficiencies were identified in the analytical data set as follows below.

MAJOR DEFICIENCIES

In the method 300.0 anions analysis, holding times for nitrate, nitrite, and orthophosphate were exceeded for all of the SDGs. Third-party validation qualified the nondetected results for these analytes in SDG K3796 as rejected with "UR" flags. The project has qualified the nondetected results for these analytes in SDG KP0175 as rejected. The short holding time in the Method 300.0 analysis was recognized and Method 353.2 was also requested to obtain usable data for nitrate and nitrite. The Method 353.2 data effectively replaces the rejected nitrate and nitrite data. Orthophosphate is not a regulated compound. The resulting data set is sufficient and usable for decision-making purposes.

MINOR DEFICIENCIES

Minor deficiencies are discussed for the 300-32 data set, as follows below. If no comments are made about a specific analysis, it should be assumed that no deficiencies affecting the quality of the data were found.

SDG K3796

This SDG comprises 19 total samples, of which 16 are field samples (J1N1M1 through J1N1M9, J1N1N0, J1N1N1, J1N1N4 through J1N1N8), 2 are trip blanks (J1N1M0, J1N1N2), and 1 is an equipment blank (J1N1N3). A primary and duplicate soil sample pair (J1N1N0/J1N1N1) are included in the field samples. The trip blanks were analyzed for volatile organic compounds (VOCs). The equipment blank was analyzed for inductively coupled plasma (ICP) metals, semivolatile organic compounds (SVOCs), and mercury. The field samples were analyzed for IC anions, nitrate, nitrite, total petroleum hydrocarbons (TPH), ICP metals, hexavalent chromium, mercury, polychlorinated biphenyls (PCBs), SVOCs, polycyclic aromatic hydrocarbons (PAH), VOCs, gross alpha, gross beta, isotopic uranium, total uranium, and by gamma energy analysis (GEA). SDG K3796 was submitted for third-party validation. Minor deficiencies are as follows:

In the SVOC analysis, the laboratory control sample (LCS) recoveries for hexachlorocyclopentadiene (44%) and pentachlorophenol (34%) are outside the quality control (QC) limits. Third-party validation qualified all results for these two analytes in SDG K3796 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the SVOC analysis, matrix spike (MS) recoveries for 2,4-dinitrophenol (0%), 3,3,-dichlorobenzidine (0%), 4,6-dinitro-2-methylphenol (44%), 4-chloro-3-methylphenol (0%), 4-chloroanaline (39%), 4-nitrophenol (0%), hexachlorcyclopentadiene (0%), and pentachlorophenol (0%) are outside the QC limits. Third-party validation qualified all of the associated results as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the SVOC analysis, matrix spike duplicate (MSD) recoveries for 2,4-dinitrophenol (0%), 4,6-dinitro-2-methylphenol (35%), hexachlorcyclopentadiene (0%), and pentachlorophenol (0%) are outside the QC limits. Third-party validation qualified all of the associated results as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the SVOC analysis, a surrogate recovery for sample J1N1N8 is outside the QC limits. Third-party validation qualified the associated analytes (2,4-dichylorophenol, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, pentachlorophenol, bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether, bis(2-chloroethoxy)methane, 4-chlorophenyl phenyl ether, and 4-bromophenyl phenyl ether) as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the relative percent difference (RPD) calculated for 4-chloroanaline (40%) is above the QC limit. Third-party validation qualified all 4-chloroanaline results in

SDG K3796 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the total petroleum hydrocarbons (TPH) analysis, no MS, MSD or LCS analysis was performed for the motor oil (MO) fraction. Third-party validation qualified all of the TPH-MO results as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the inductively coupled plasma (ICP) metals analysis, the MS recovery for antimony (45.5%) is outside the QC limits. Third-party validation qualified all associated antimony data as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the polychlorinated biphenyl (PCB) analysis, surrogate recoveries in samples J1N1M7 and J1N1N4 are outside QC limits. Third-party validation qualified all PCB results for samples J1N1M7 and J1N1N4 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the polycyclic aromatic hydrocarbons (PAH) analysis, MS recoveries for naphthalene (29%), acenaphthylene (36%), acenaphthene (20%), and the MSD for naphthalene (39%) are outside QC limits. Third-party validation qualified all data for these analytes in SDG K3796 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the PAH analysis, a surrogate recovery in sample J1N1N7 is outside QC limits. Third-party validation qualified all PAH results for sample J1N1N7 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the PAH analysis, RPDs calculated for acenaphthylene (68%), acenaphthene (110%), fluroene (56%), and anthracene are outside QC limits. Third-party validation qualified all results for these analytes in SDG K3796 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the method 300.0 anions analysis, holding times were exceeded by more than twice the limit for nitrate, nitrite, and orthophosphate. Non detected results for these analytes are discussed above in the Major Deficiencies section. Detected results for nitrate, nitrite, and orthophosphate were qualified by third-party validation as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the method 300.0 anions analysis, sulfate was detected in the method blank (MB). Sulfate results in samples J1N1M3, J1N1M4, J1N1M5, J1N1M6, J1N1M8, J1N1N0, J1N1N1, and J1N1N6 were qualified by third-party validation as estimated with "J" flags. Estimated data are usable for decision-making purposes.

SDG KP0175

This SDG comprises three composite field samples (J1R866 through J1R868) analyzed for TPH. Minor deficiencies are as follows:

In the TPH analysis, no MS, MSD or LCS analysis was performed for the MO fraction. Results for TpH-MO may be considered. Estimated data are usable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

Relative percent difference evaluations of main sample(s) versus the laboratory duplicate(s) are routinely performed and reported by the laboratory. Any deficiencies in those calculations are reported by SDG in the previous sections.

Field quality assurance (QA)/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. Field QA/QC samples, listed in the field logbook (WCH 2012), are the primary and duplicate samples (J1N1N0/J1N1N1). The main and QA/QC sample results are presented in Appendix B.

Field duplicate samples are collected to provide a relative measure of the degree of local heterogeneity in the sampling medium, unlike laboratory duplicates that are used to evaluate precision in the analytical process. The field duplicates are evaluated by computing the RPD of the sample/duplicate pair(s) for each contaminant of potential concern (COPC). Relative percent differences are not calculated for analytes that are not detected in both the main and duplicate sample at more than five times the target detection limit. Relative percent differences of analytes detected at low concentrations (less than five times the detection limit) are not considered to be indicative of the analytical system performance. The calculation brief in Appendix B provides details on duplicate pair evaluation and RPD calculation.

The RPD calculated for uranium (51.6%) is above the acceptance criteria of 30%. Elevated RPDs in environmental samples are generally attributed to natural heterogeneities in the sample matrix. The data are usable for decision-making purposes.

A secondary check of the data variability is used when one or both of the samples being evaluated (main and duplicate) is less than five times the target detection limit (TDL), including undetected analytes. In these cases, a control limit of ±2 times the TDL is used (Appendix B) to indicate that a visual check of the data is required by the reviewer. No data required this check. A visual inspection of all of the data is also performed. No additional major or minor deficiencies are noted. The data are usable for decision-making purposes.

Summary

Limited, random, or sample matrix-specific influenced batch QC issues such as those discussed above, are a potential for any analysis. The number and types seen in the data set are within expectations for the matrix types and analyses performed. The DQA review of the 300-32 waste

site confirmatory sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling. The DQA review for 300-32 waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. The analytical data were found acceptable for decision-making purposes. The confirmatory sample analytical data are stored in the Environmental Restoration project-specific database prior to being submitted for inclusion in the Hanford Environmental Information System database. The confirmatory sample analytical data are also summarized in Appendix B.

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